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The information given in this document is not to be communicated, either directly or indirectly, to the Press or to any person not authorized to receive it.

6-ft. WADING INSTRUCTIONS

FOR THE

SHERMAN V, A.R.V. I

(FOR USE IN ALL THEATRES)

CHILWELL CAT. NO. 72/796

ON LOAN
RETURN TO T/S

This publication has been produced to the instructions of the Chief Inspector of Fighting Vehicles, to whom all communications should be addressed.

FIRST EDITION

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FOR THE

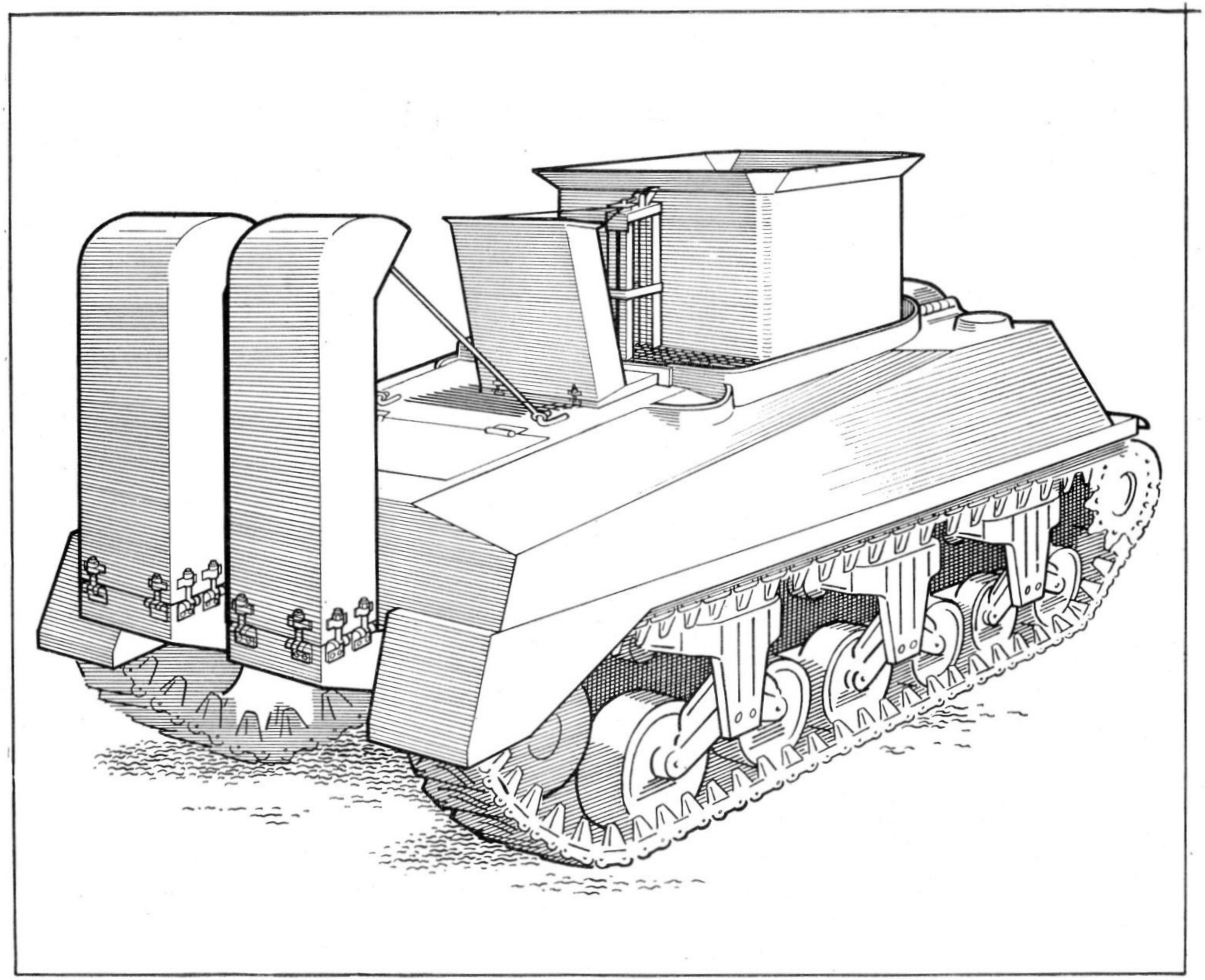
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(FOR USE IN ALL THEATRES)

CHILWELL CAT. NO. **72/796**

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FIRST EDITION
February, 1945



SHERMAN V A.R.V.I PREPARED FOR 6-FT. WADING

Vocab. Section and Part No.	DESCRIPTION	No. Off	Remarks
LV6/MT15/NIV1381	KIT " C " SHERMAN V A.R.V. I	1	6-ft. Wading.
LV6/MT15/TD9940	Bag, co-driver's M.G.	1	
LV6/MT15/TD11446	Cover, ventilating cowl, hull, front...	2	16" dia.
LV6/MT15/TD11447	Cover, ventilating cowl, hull, rear	1	21" dia.
LV6/MT15/TD11448	Cover, ventilating cowl, sponson, left	1	
LV6/MT15/TD11449	Cover, ventilating cowl, sponson, right	1	
LV6/MT15/TD11450	Cover, sponson drain holes	2	5" × 5"
LV6/MT15/TD11452	Cover, intake seating	1	38½" × 5¾"
LV6/MT15/TD11453	Strip, air intake frame, front	1	60" × 4" to be used as "spare"
LV6/MT15/TD11454	Cover, air intake grille	1	16" × 15"
LV6/MT15/TD11455	Strip, tab	1	48" × 3" to be used as "spare"
LV6/MT15/TD9928	*Relt, air exit adaptor cover	2	18½" long
LV6/MT15/TD9929	*Relt, air exit adaptor cover	2	33 5/16" long
LV6/MT15/TD9930	Relt, inlet stack	2	6⅝" long
LV6/MT15/TD9931	Relt, inlet stack	2	36" long
LV6/MT15/TD9932	Relt, exit stack	4	12½" long
LV6/MT15/TD9933	Relt, exit stack	4	17" long
LV6/MT1/NIV3336	Insulating tape, ½" ... ... 2-oz. roll	4	
LV6/MT1/NIV3329	Brush, 2"	1	
LV6/MT1/NIV3330	Brush, 1"	2	
LV6/MT1/NIV3331	Brush, wire, scaling	1	
LV6/MT1/NIV5043	Knife, putty	1	
LV6/MT1/NIV5044	Scraper	1	
LV6/MT1/NIV3332	Scissors	1	
H1/HA0036	Chalk, white ... ... sticks	2	
LV6/MT1/NIV3325	Bostik Cleaner ... ... 1-qt. tins	2	
LV6/MT1/NIV5346	Bostik 89 AA ... ... 1-qt. tins	10	
LV6/MT1/NIV5349	Bostik 89 AA tube ... ... tubes	11	
LV6/MT1/NIV5039	Boscoprene A ... ... ½-pint tins	2	
LV6/MT1/NIV5040	Boscoprene B ... ... bottles	2	
LV6/MT1/NIV5345	Wading Plastic No. 2 ... ... lbs.	160	
LV6/MT1/NIV3527	Grease G.S. ... ... lbs.	14	
B1/BA0518	Pullthrough, single, Mk. IV.B	2	
LV6/MT15/ZA15437	Bags, waterproofing, No. 1	3	For microphones
LV6/CT72/643	Instruction book	1	
	KIT " D " SHERMAN V A.R.V.I		6-ft. Wading
LV6/MT1/NIV5346	Bostik 89 AA ... ... 1-qt. tins	1	
LV6/MT1/NIV4096	Asbestos Compound ... ... lbs.	21	
LV6/MT1/NIV3330	Brush, 1"	1	

* Not required for sealing cover plate.

Approximate man-hours per stage:—

Stage 1.	Crew	250
Stage 2.	Crew	32
Stage 3.	Crew	10

(NOTE.—Only the *sealing* stages are shown.)

A TASK CARD LISTING THE TASKS TO BE CARRIED OUT IN STAGES 1, 2 and 3 WILL BE FOUND AT THE BACK OF THIS BOOK.

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The following Colour Code is used on illustrations :—

Blue—Bostik.

Orange—Boscoprene.

Stone—Wading Plastic No. 2.

Grey—Asbestos Compound.

Green—Fabric.

ILLUSTRATIONS

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NOTES

CHAPTER I

MATERIALS AND THEIR USES

CLEANLINESS IS THE FIRST ESSENTIAL of successful sealing.

Mud, oil, grease and water will each spoil adhesion of the sealing compounds. Whenever work is taking place on sealing during wet weather, efficient cover must be arranged over the vehicle.

THIS PARTICULARLY APPLIES WHEN USING WADING PLASTIC No. 2

A. CLEANING MATERIALS

For cleaning, the following are used :—

Scraper, Putty Knife and Wire Brush for removing caked mud, loose paint, etc., that water will not shift. The putty knife will also be used for working Bostik into joints.

Clean Rag or Cotton Waste for wiping down after washing, or for use with petrol or Bostik cleaner.

Petrol is used for the preliminary cleaning of all oily surfaces. After using petrol finish off with Bostik cleaner. Petrol must not be used on any of the Bostik compounds, as it will cause them to peel off. When 80 octane spirit is used for cleaning, the vehicle must stand in the open, and afterwards be thoroughly ventilated.

Bostik cleaner for finally cleaning surfaces before applying a sealing compound, and for cleaning joints already sealed, when a repair is necessary. Also used for keeping brushes soft. Apply sparingly.

Do not use Bostik cleaner as a thinner for any of the sealing materials.

USE WATER first, then PETROL, and BOSTIK CLEANER to finish off cleaning.

SURFACES MUST BE CLEAN AND DRY

B. SEALING MATERIALS

BEFORE USING ANY OF THE SEALING MATERIALS, REMEMBER THE PREPARED SURFACE MUST BE DRY AS WELL AS CLEAN.

Asbestos Compound. (7 lb. containers) A tenacious and easily worked compound used for sealing such parts as hatches, adaptor doors and turret rings. It must be thoroughly worked in the hands and then applied about ½" thick with all edges "feathered off" and the top smoothed over to present an unbroken surface. Asbestos Compound may be referred to hereafter as A.C.

Any tasks involving the use of Asbestos Compound *MUST* be carried out as late as possible prior to disembarkation.

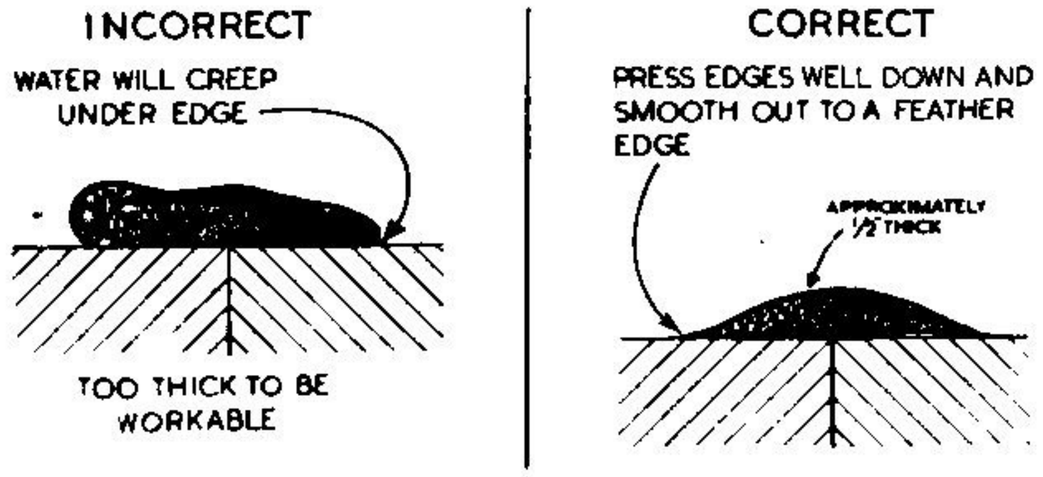


Fig. 1. Applying Asbestos Compound

Boscoprene 551. Is a sealing compound which sets without coming into contact with the air. When set, it is not affected by oil or heat, and therefore is used especially for sealing in such places as the engine compartment. It is supplied in two parts : (Part A) in tins, and (Part B), in bottles. *To use* : Shake the bottle well, add the whole quantity to the Boscoprene 551, Part A, and mix well by stirring. *Boscoprene must be used immediately after mixing.* Even replacing the lid on the tin will not stop it from setting hard.

When the Boscoprene is set, cover over the joint and exposed Boscoprene with Bostik 89 AA. Tube.

Bostik 89 AA. (1 quart tins) A compound used as :—

(*a*) A primer for Wading Plastic No. 2.
(*b*) A sealing compound for tight fitting seams, bolt heads and rivet heads.
(*c*) An adhesive for adhering fabric to metal or fabric to fabric.
When applied to fabric omit use of Bostik cleaner.

When used as an adhesive, it must be applied to both mating surfaces, and allowed to become "tacky" (nearly dry) before pressing the surfaces together.

Replace the lid on the tin immediately after use, or the compound will become unworkable. Do not get any water into the tin.

IMPORTANT. To apply Bostik 89 AA, brush it on with a firm short brush movement crossing the seam and packing compound in it. Get plenty of the compound on the brush, and work it into the surface until there is a good covering of compound. *Bostik 89 AA must be worked right into seams. Do not just draw the brush straight along a seam, or merely dab on the compound.*

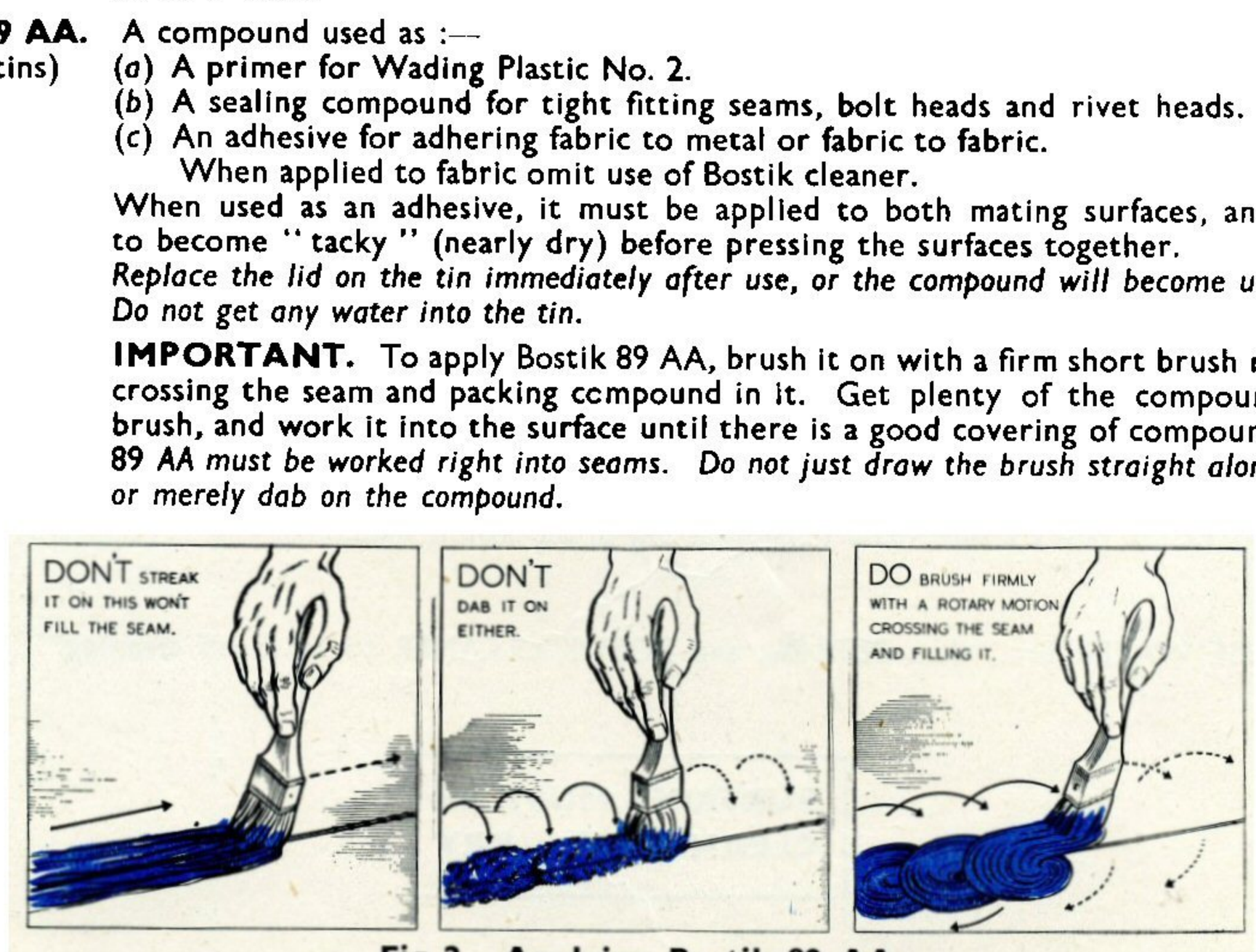


Fig 2. Applying Bostik 89 AA

Asbestos Compound. Bostik.

Bostik 89 AA/Tube. Is a sealing cement supplied in tubes, with detachable nozzles, which are operated by winding a key at the bottom of the tube. Will be used exclusively for sealing along seams between plates and as an outer coating around inspection covers which have been previously sealed with Boscoprene. Apply it by holding the nozzle to a seam and turning the key. In cold weather, warm the tube slightly to give an easy flow of compound ; if the cement is too stiff, the tube will burst. *Replace the cap on tube after use, and always keep the detachable nozzle clean.* Wash it out with Bostik cleaner before putting it away. To obtain adequate filling it may be necessary to press the compound into the seam with a knife.

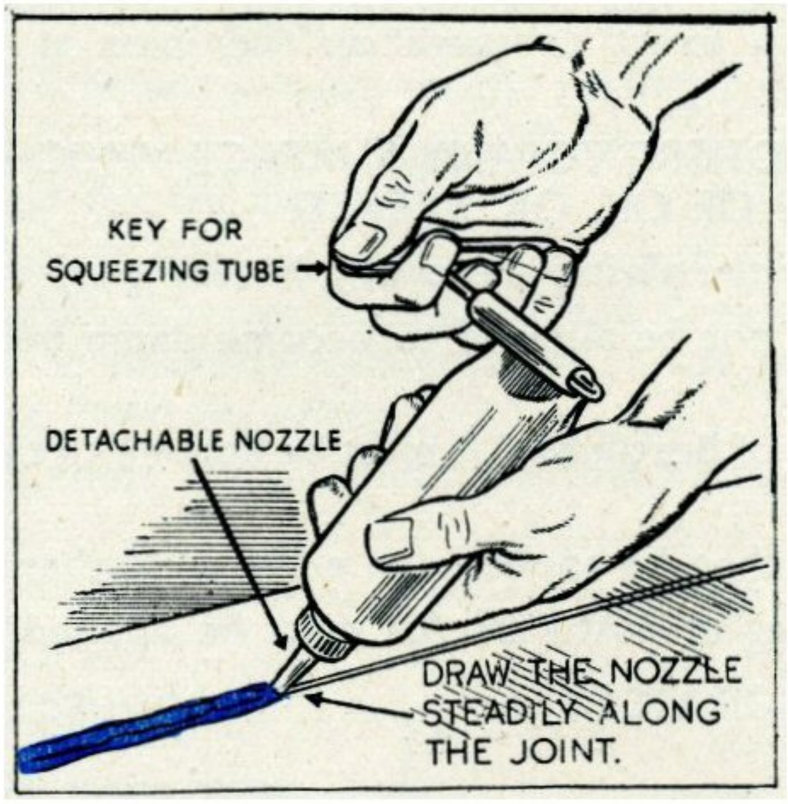


Fig. 3. Applying Bostik 89 AA/Tube

Insulating Tape. (2—2 oz. rolls in tins.) Used over vent holes, breathers, electrical components, etc. The tape may be wrapped round a component and covered with a sealing compound, in cases where it is undesirable for the compound to be in direct contact with the component.

Relt Sealing Strips. Rubberized felt used as a seal at the base of air stacks. Attached to its seating with Bostik 89 AA. Air stacks must not be erected on the rubberized felt until the Bostik securing it to the seating has been allowed at least 12 hours to dry. Bostik 89 AA must not be applied to the top surface of the rubberized felt because this will prevent the stack from being jettisoned.

Wading Fabric No. 2. Must be handled with care and kept clean. It is used for sealing gun apertures, etc. It is supplied in shaped pieces ready for fitting, but some trimming may be required. Spare pieces may be included in kits.
The fabric pieces will be stencilled on the inside to give the position in which they are to be fixed. Before fitting, they must be examined for any holes or thin places. Repair by means of a fabric patch attached with Bostik 89 AA.

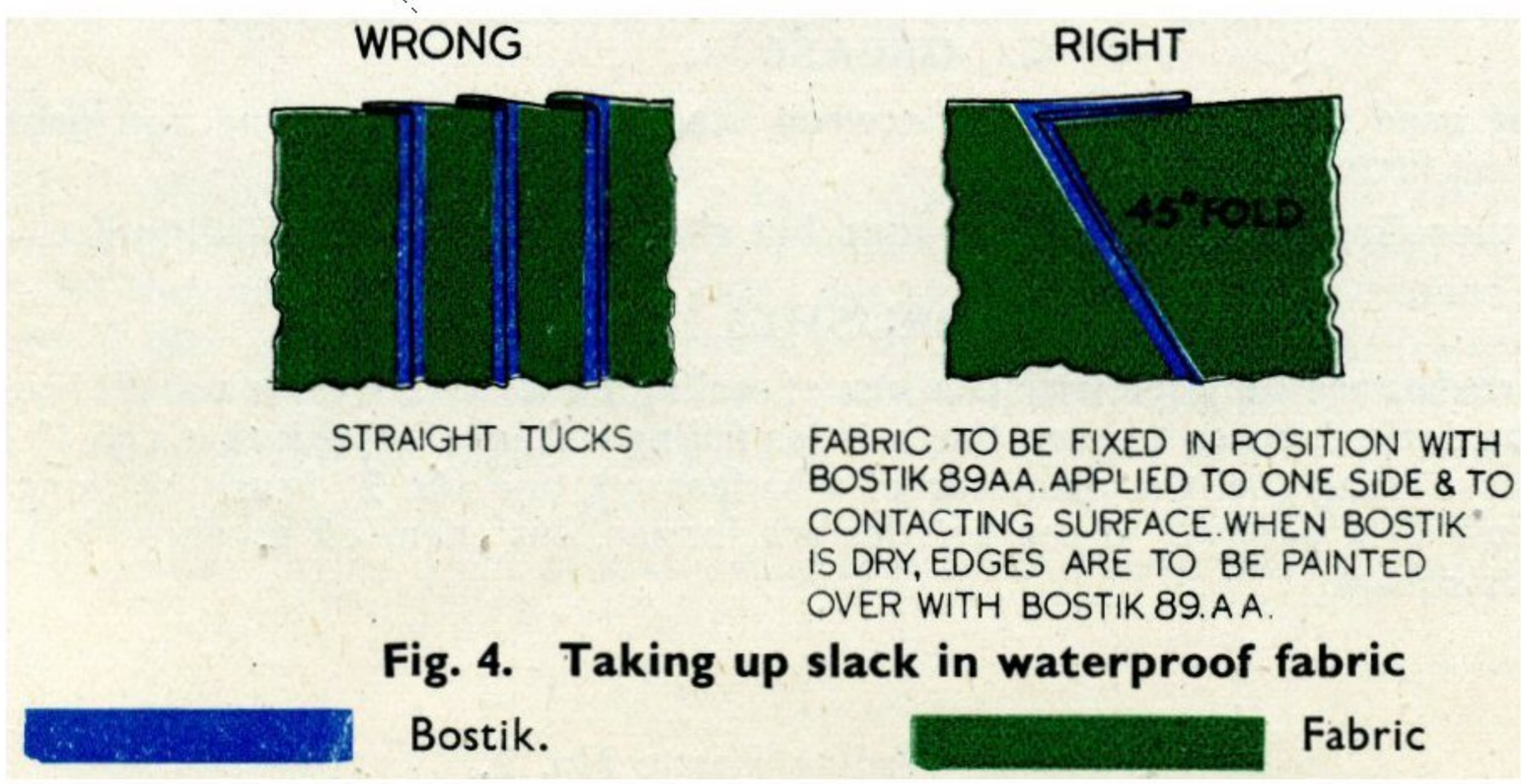


Fig. 4. Taking up slack in waterproof fabric

Fabric covers are attached to metal by means of Bostik 89 AA which is applied to contacting surfaces, and must be allowed to become nearly dry before making the joint. Allow about two hours for the joint to set, then paint over the edges of the fabric with Bostik 89 AA.
Avoid wrinkles at the edges of the fabric, and if a fold is necessary, make it at 45° to the edge.

Wading Plastic No. 2. (4 lb. cartons.) A brown rubbery substance with which quite large holes can be filled. Where a large plug of plastic is required, it should be built up in layers of not more than $\frac{3}{16}$", each layer being worked out to a "feather" edge. Because of its elasticity, it is necessary to exert pressure on the mass at the same time as the edges are "feathered."

IT WILL NOT ADHERE TO ANY SURFACE WHICH IS NOT ABSOLUTELY CLEAN, DRY AND FREE OF OIL OR GREASE.

If in cold weather the plastic is too stiff, kneading for a short time will make it workable.

The plastic must not be allowed to become damp before application, otherwise it will not adhere.

A primer coating of Bostik 89 AA must be applied to the surface to be sealed and allowed to dry.

The plastic must then be applied and edges "feathered" off.

No further coating of Bostik 89 AA must be applied.

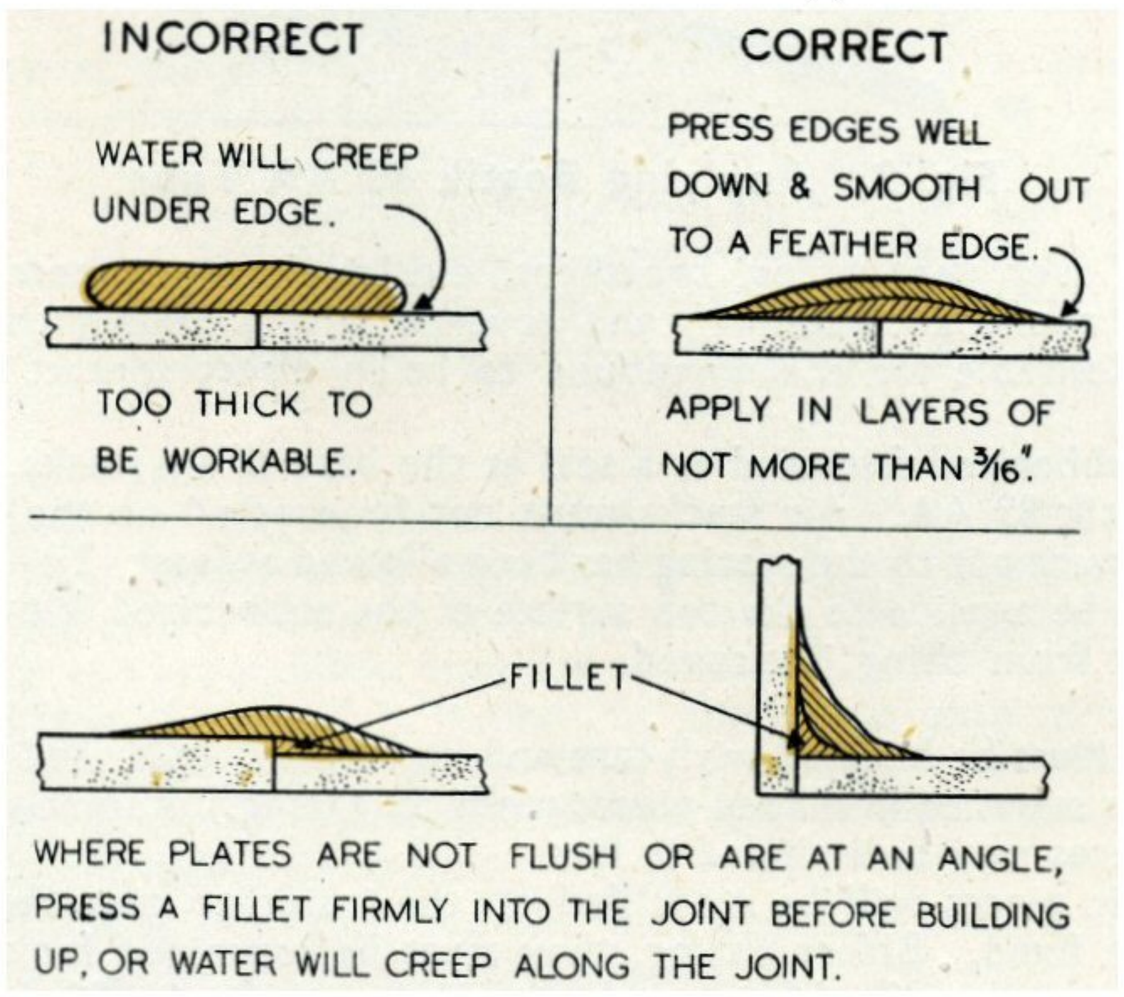


Fig. 5. Sealing with Wading Plastic No. 2

C. GREASE

Grease G.S. (7 lb. tins.) Will be used for sealing joints between stacks and adaptors and for protection of external fittings.

No other Grease G.S. should be used but that supplied in the Wading Kit.

D. BRUSHES

Brushes. 1" and 2" brushes are supplied with the kits of sealing materials. Before use all brushes must first be soaked, so as to stop the bristles falling out, then check that the 1" brush has bristles 1" long (*i.e.* the diameter of a halfpenny), and the 2" brush $1\frac{1}{4}$" long (*i.e.* the diameter of a penny). If the bristles are longer, cut them off to these lengths. Cut bristles square.

Allocate the brushes as follows :—

1" brushes for Bostik 89 AA and Boscoprene.

2" brush for dusting, and then for applying Bostik 89 AA.

When not in use keep brushes soaked in Bostik cleaner or petrol, but thoroughly dry before re-using.

INSPECT FOR

CLEANLINESS AND DRYNESS before putting on the sealing compounds.

WASTE of materials through painting Bostik alongside of instead of in the joints, leaving the lids off tins, failure to clean and dry brushes.

EFFICIENCY of all sealing. Bostik must be applied in an unbroken film, check that this is so in all awkward corners. Plastic, asbestos compound and grease must present an unbroken surface, and the Plastic must be properly feathered off at the edges. Fabric must be folded neatly, with no gaps in sticking down the edges.

COMPLETION of all items in these instructions, and that work has been done according to the instructions.

CHAPTER II

STORES REQUIRED FOR SEALING

Index to Special Kits

Kit		
A	Hardware stores which crews will need during Stages 1 and 2 of the Sealing Instructions.	1 per vehicle
C	Software stores which crews will need during Stages 1 and 2 of the Sealing Instructions.	1 per vehicle
D	Software stores which crews will need during Stage 3 of the Sealing Instructions.	1 per vehicle

NOTE. The stores issued are adequate for the task of waterproofing this vehicle, but further supplies of all materials listed can be obtained on demand. Indents for additional materials should be forwarded to A.D.O.S. with a covering letter giving reasons for the additional requirement.

IMPORTANT

Kit " D " will be supplied in a box marked " Not to be opened until just prior to embarkation," and this box will be included in Kit " C." It is imperative that this instruction be adhered to, otherwise units will find they are short of stores to carry out the work required by Stages 2 and 3 of the Sealing Instructions. If after completing the work required by Stage 1 of the Sealing Instructions, any of Kit " C " remains unused, this should be taken to the point of embarkation for use as spares.

Cases containing kits are marked " Case 1 of 3 " or " Case 2 of 4 ". Ensure you have all the cases.

On the following pages all items in the Kits are listed. This is done to enable the kits to be checked on receipt by units. In the event of a kit being found incomplete the fact should be reported.

DETAILS OF KITS.

Vocab. Section and Part No.	DESCRIPTION	No. Off	Remarks
LV1/USA/W16025	KIT "A" SHERMAN V A.R.V. 1.	1	6-ft. Wading.
LV1/USA/S344/1	Air Exit Adaptor, R.H.	1	
LV1/USA/S344/2	Air Exit Adaptor, L.H.	1	
LV1/USA/S344/3	Washer strip for Air Exit Adaptor (2" × $\frac{1}{8}$" × 18")	2	
LV1/USA/S344/4	Cover plate	1	
LV1/USA/S344/5	Washer strip for Cover Plate (2" × $\frac{1}{8}$" × 13") ...	2	
LV1/USA/S344/6	Air Exit Stack	2	
LV1/USA/S344/7	Washer for Air Exit Adaptor ($1\frac{1}{2}$" × $1\frac{1}{4}$" × $\frac{1}{8}$") ...	38	
LV1/USA/S344/8	Washer for Air Exit Adaptor ($1\frac{1}{2}$" × $1\frac{1}{2}$" × $\frac{1}{8}$") ...	6	
LV1/USA/S344/9	"T" bolt for Air Exit Adaptors and Stacks (TD9294G)	12	
LV1/USA/S344/13	Rod Strainer complete with B.S.W. nut, locknut and washers	2	
	Bolt, hex. hd. B.S.W., $\frac{5}{16}$" × 1", complete with nuts and spring washers	20	
	Set screws, hex. hd. B.S.W., $\frac{5}{16}$" × $\frac{3}{4}$", complete with spring washers	16	
	Bolts, hex. hd. B.S.W., $\frac{1}{2}$" × 4", complete with nuts, spring washers and plain washers	6	
	Washer, plain, $\frac{1}{2}$" for Tee bolts	24	
LV1/USA/TD9906	Air Inlet Stack	1	
LV1/USA/TD9926	Strainer, air inlet stack	1	
LV1/USA/TP18561	Gear, release, air inlet stack...	1	
LV1/USA/W1059	Bolt, B.S.F., hex. hd., $\frac{3}{8}$" × $1\frac{1}{4}$"	8	
LV1/USA/W17413	Screw, B.S.F., hex. hd., $\frac{3}{8}$" × $1\frac{1}{4}$"	1	
LV1/USA/V9539	Nut, B.S.F. hex., $\frac{3}{8}$"	8	
LV1/USA/V16100	Washer, spring, $\frac{3}{8}$"	9	
LV1/USA/V16101	Washer, plain, $\frac{3}{8}$"	6	
LV1/USA/V9540	Nut, B.S.F. hex., $\frac{1}{2}$"	2	
LV1/USA/V16102	Washer, spring, $\frac{1}{2}$"	2	
LV1/USA/V16103	Washer, plain, $\frac{1}{2}$"	2	
LV1/USA/V12411	Rope, 2"	2	16' long.
LV1/USA/ZA10594	No. 1B Jumper Lead, 10' (19 set)	1	
LV1/USA/130517	False turret side plate	2	
LV1/USA/130518	False turret end plate	2	
LV1/USA/298175	False turret corner angle iron	2	
LV1/USA/298300	Turret door stay	1	
LV1/USA/298297	False turret corner angle iron	2	
LV1/USA/298174	False turret corner plate	4	
LV1/USA/FB106/6D	Bolt for false turret plates	42	
LV6/MT5/FB106/6D	Bolt for false turret corner plates	16	
LV6/MT5/19623	Nuts, $\frac{3}{8}$"	58	
LV6/MT5/9724	Washer, Shakeproof	58	
LV6/MT5/FB106/8D	Bolt for release gear stand	4	
LV6/MT5/19623	Nuts, $\frac{3}{8}$"	4	
LV6/MT5/9724	Washer, Shakeproof	4	
LV1/USA/298182	Step assembly	1	
LV6/MT5/FB106/6D	Bolt for step assembly	4	
LV6/MT5/19623	Nut, $\frac{3}{8}$"	4	
LV6/MT5/9724	Washer, Shakeproof	4	
LV1/USA/130564	Release gear stand	1	

CHAPTER III

MAINTENANCE BEFORE SEALING

To carry out this maintenance, it is necessary to remove the four access plates marked " A " in Fig. 10 and also the air inlet grille, the radiator cover plate and the sandshields.

In addition, if a dust deflector is fitted on the rear of the vehicle, it must be removed.

DO NOT REPLACE THESE ITEMS UNTIL INSTRUCTED TO DO SO IN THE SEALING INSTRUCTIONS.

A general check-up must be made to ensure that the vehicle is in first class condition, and *particular attention must be given to the following items* :—

1. The Engine

(*a*) Check the ignition equipment.
Remove each distributor cover and clean distributors carefully.
Make certain that the interior is quite dry.

(*b*) Check starting. Wading requires instantaneous starting, both hot and cold.
If starting is difficult when the engine is hot, examine the carburettor chokes to see that they operate correctly. CHOKES MUST CLOSE FULLY.

(*c*) Check up on petrol filter and carburettor filters.

(*d*) Check the cooling system, wading will tax it severely. See that all hose connections and joints are sound. Do not overfill the cooling system, as an overflow when the engine is hot may damage the sealing.

(*e*) Do not allow the petrol tank to run dry during road run. Make sure the re-fuelling takes place BEFORE the tanks are empty.

2. Lubrication

Complete every requirement of the vehicle Lubricant Chart in the Crew Maintenance Insert to A.B. 413 irrespective of when last lubricated. Pay particular attention to the following points :—

(*a*) All exposed working parts to be lubricated with Grease G.S.

(*b*) Lubricate the two steering control levers and linkage. Pay special attention to the right hand steering control cross shaft bearing. *No lubricator is provided : Therefore an oil can must be used.*

(*c*) Lubricate clutch pedal shaft, and also make sure that the clutch thrust race is adequately lubricated. There are three lubrication holes on the race carrier in addition to the two greasers.

(*d*) Lubricate accelerator pedal, rods and linkage. NO MOVING PART OF LINKAGE MUST REMAIN WITHOUT LUBRICANT.

(*e*) Bogie wheels and top rollers should be *well packed* with grease. Check relief valves on bogie wheels.

(*f*) Lubricate the hinges on the driver's and co-driver's hatches and ensure that they open and shut freely.

(*g*) Smear Grease G.S. on all pivots, bearings and joints of the choke and throttle controls in the engine compartment.

THE CHOKES are controlled from a spindle above the forward end of the engine, by rods to Nos. 1, 2 and 5. Chokes Nos. 3 and 4 are controlled by extension rods from Nos. 2 and 5.

THE THROTTLES are all linked together by rods up the L.H. side, across the top and down the R.H. side of the engine.

(*h*) FUEL CUT-OFF VALVES (in rear corners of engine compartment). Thoroughly smear Grease G.S. on fuel cut-off valves, operating cranks and pivots.

(*i*) CLUTCH. With the air intake grille removed, liberally smear Grease G.S. on and around the lever pin, guides and springs of each of the three disengaging mechanisms. In order to do this thoroughly, it will be necessary to rotate the clutch so that each mechanism is in turn at the top.

3. Transmission Casing

Check all casing bolts and also bolts securing the casing to the hull. Replace any missing bolts, screws, etc. *These must be tight.*

ARMY PERSONNEL have already proved these instructions to be 100 per cent. effective.

IT ALL DEPENDS ON YOU to do the job thoroughly.

DON'T EXPERIMENT.

SURFACES MUST BE CLEAN AND DRY

CHAPTER IV

SEALING INSTRUCTIONS

STAGE I

Work to be carried out in the field or in concentration area.

After completion of this stage the vehicle must not be driven more than 100 miles.

All operations are designed to be carried out by the vehicle crew.

TASK 1

INITIAL PREPARATION

Remove all external stowage, also the bin from the sloping rear protection plate.

CLEAN the vehicle, but not on the stand where the sealing will be carried out. First run it on to sleepers to give access to the bottom, then proceed as follows :—

(*a*) Remove the worst of any mud and dirt by use of the putty knife and wire brush.

(*b*) Wash down the vehicle with water. An ordinary stirrup pump has been found most efficient for doing this, using the jet to clean out awkward corners.

(*c*) Remove any remaining mud with the putty knife or wire brush, and let the vehicle dry off.

(*d*) Clean out the engine and transmission compartments with petrol, making sure that no oil remains on the floor plates. Any oil left on the plates or in the seams will seep out and destroy the sealing.

(*e*) Clean off any other oil or grease with petrol.
Never use paraffin or diesel oil for cleaning. Both these come under the category of oil which must be cleaned off.

(*f*) Clean all parts to which sealing compound is to be applied, by using Bostik cleaner applied with clean rag or cotton waste.

(*g*) Move vehicle to a clean standing.

(*h*) Make sure that cover can be erected in the event of wet weather, without moving the vehicle.

(*i*) Break the tracks, remove sprockets and front sandshields.



Fig. 6.
Sealing distributor.

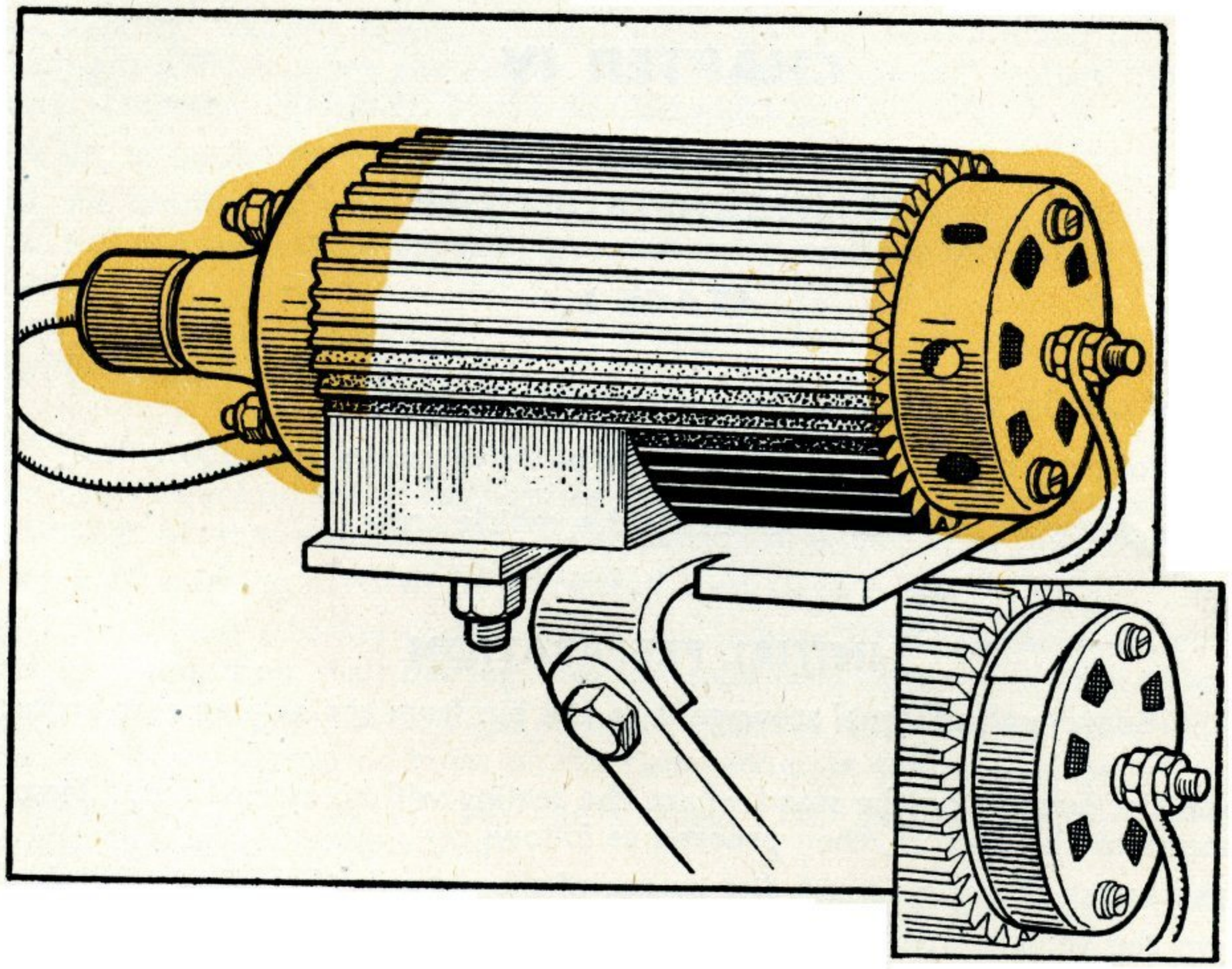


Fig. 7.
Sealing coil.

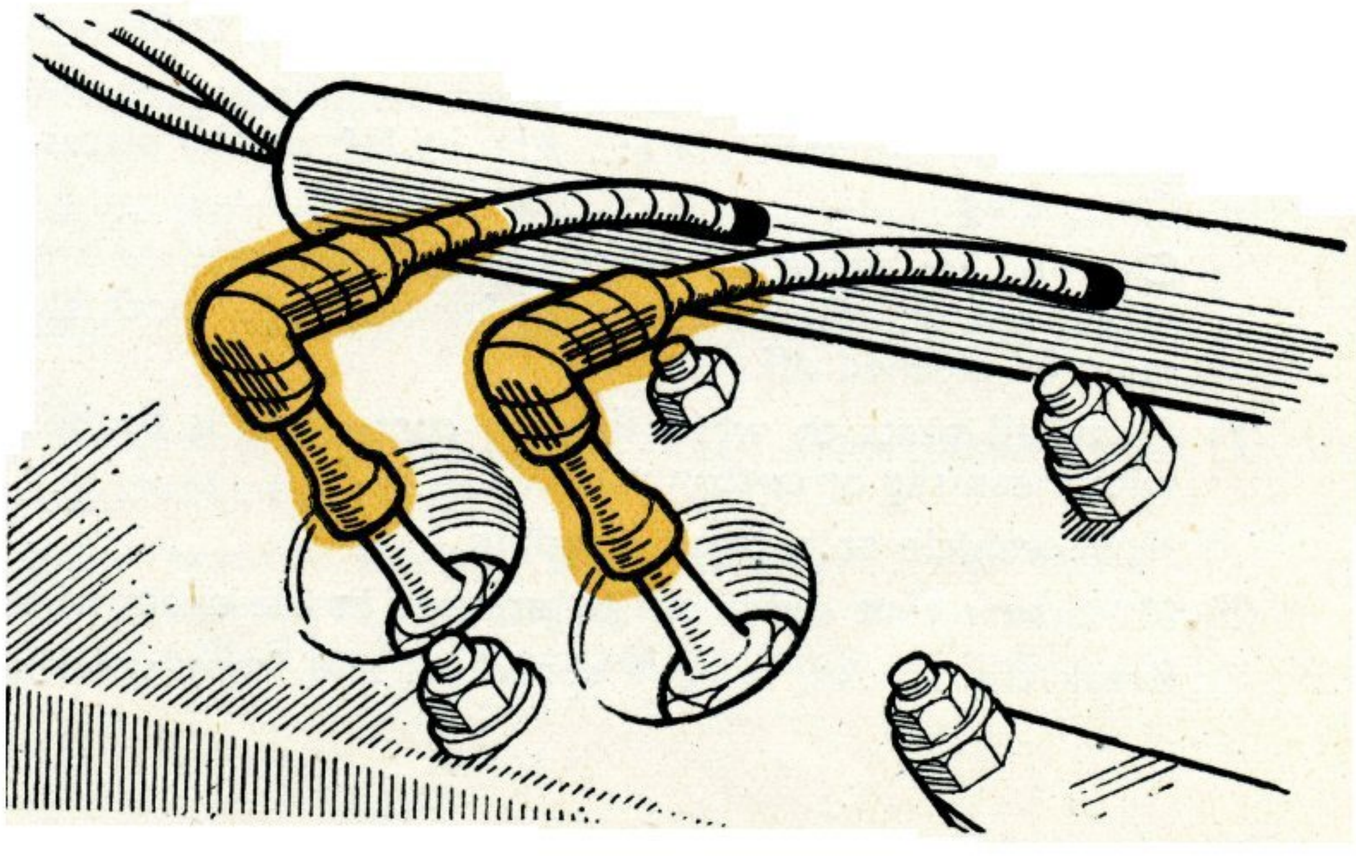


Fig. 8.
Sealing H.T. leads.

Wading Plastic
No. 2.

TASK 2

ENGINE PROTECTION

Remember that, after sealing, the ignition equipment cannot be adjusted. Only when satisfied that no further adjustment will be required, seal as follows, using Wading Plastic No. 2.

Before applying the plastic, carefully paint on a priming coat of Bostik 89 AA. Allow the Bostik to dry thoroughly before sealing with plastic.

1. Distributors (see Fig. 6)

(*a*) With Wading Plastic No. 2 cover the distributor cap, leaving the rubber breather covers unsealed. Similarly, apply plastic to the ends of all H.T. leads, so that no water can get into the distributor or to the base of the leads.

(*b*) Cover the suppressor unit with plastic.

2. Coils (see Fig. 7)

(*a*) Wrap insulating tape over the holes in the end cap of the coil body. Make a pad of plastic and cover the end of the first coil. Press the edges of the plastic down on the body, and seal carefully around the leads, but do not force plastic through the holes in the coil end plate and on to the filament.

(*b*) Repeat this operation to seal both ends of each of the five coils.

3. Thermometric Plugs

Cover the nine plugs on cylinder heads with plastic. The plugs on the two lower blocks (Nos. 3 and 4) are reached through the floor inspection plates. Those of blocks Nos. 1, 2 and 5 are reached from above. Most of the plugs are not visible, but their nature and approximate position can be known from those on block No. 1 (see Fig. 9).

This work should be done before the sealing of the sparking plugs, in order not to disturb their sealing.

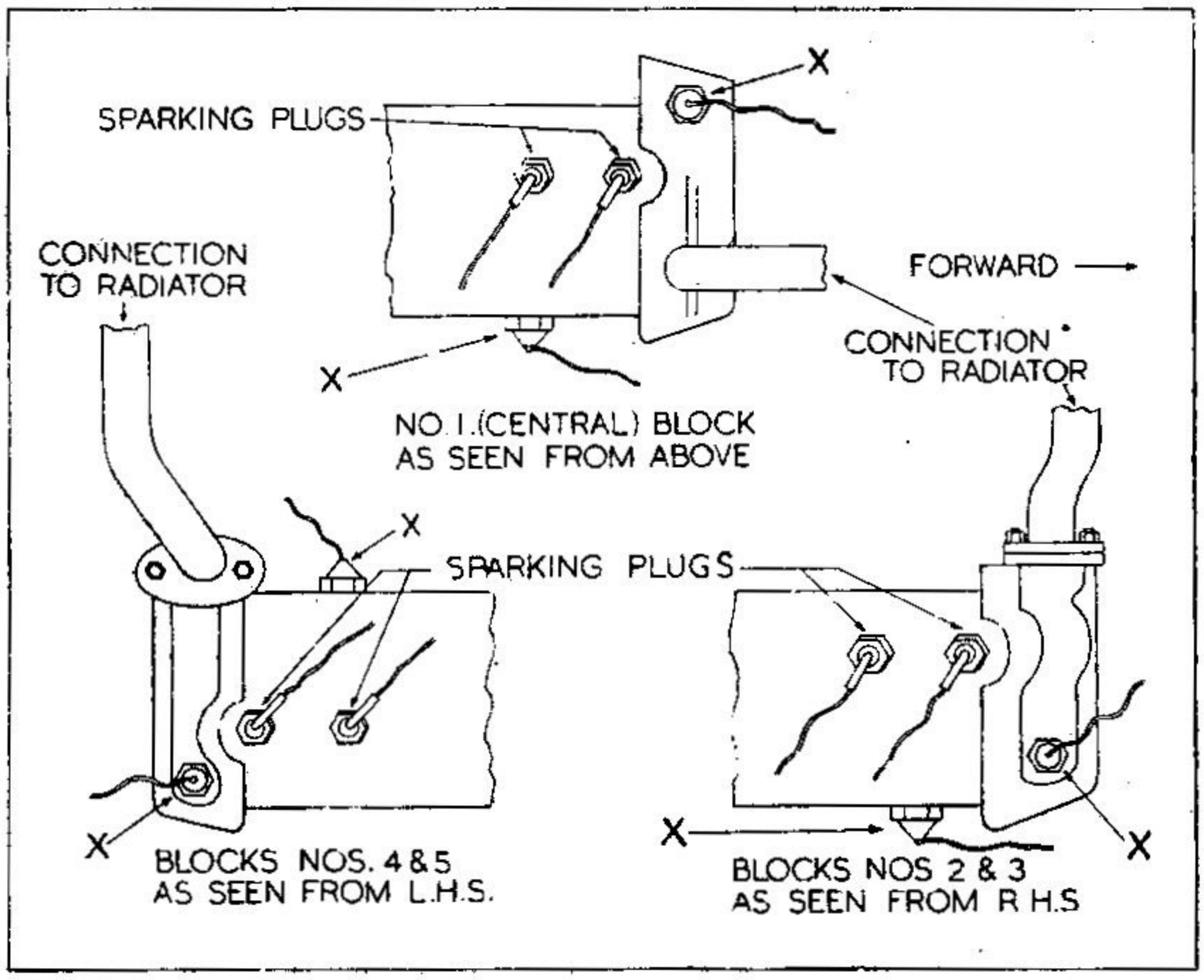


Fig. 9. Location of thermometric plugs

Make sure there is a good seal, but do not cover the plugs with plastic or cooling will be upset.

4. Carburettor No. 3 (bottom L.H.S.)

NOTE.—New type Sherman V vehicles have five carburettors in a row on top of the engine, and no sealing is required.

Plaster Wading Plastic No. 2 all over the carburettor, exits of control from it, and aluminium elbows.

There is no external breather.

The other carburettors do not require protection.

5. H.T. Leads (see Fig. 8)

Cover the sparking plug connectors with plastic, making sure that it just overlaps the porcelain of the plug body, and also fully seals the joint of the H.T. lead to the connector.

SURFACES MUST BE CLEAN AND DRY

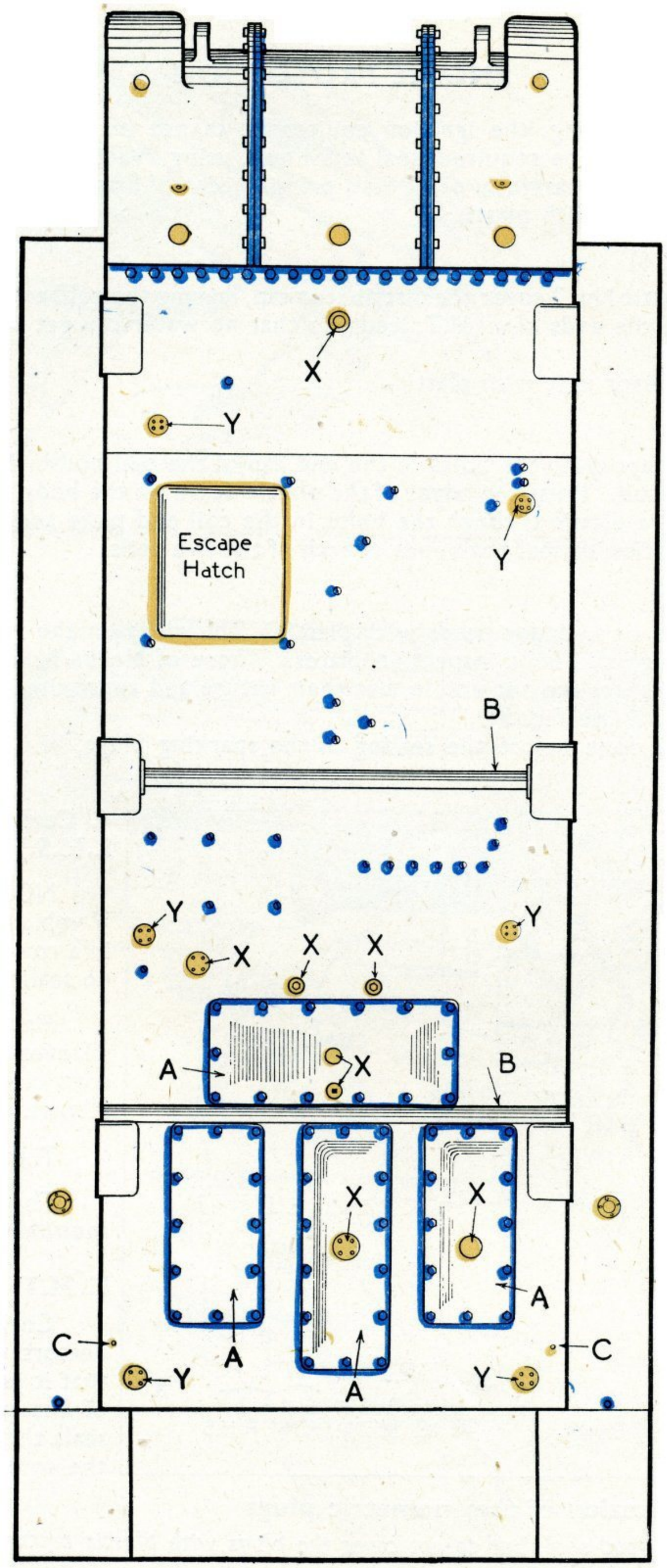


Fig. 10. Diagram of hull bottom seen from below.

Bostik (see Text). Wading Plastic No. 2.

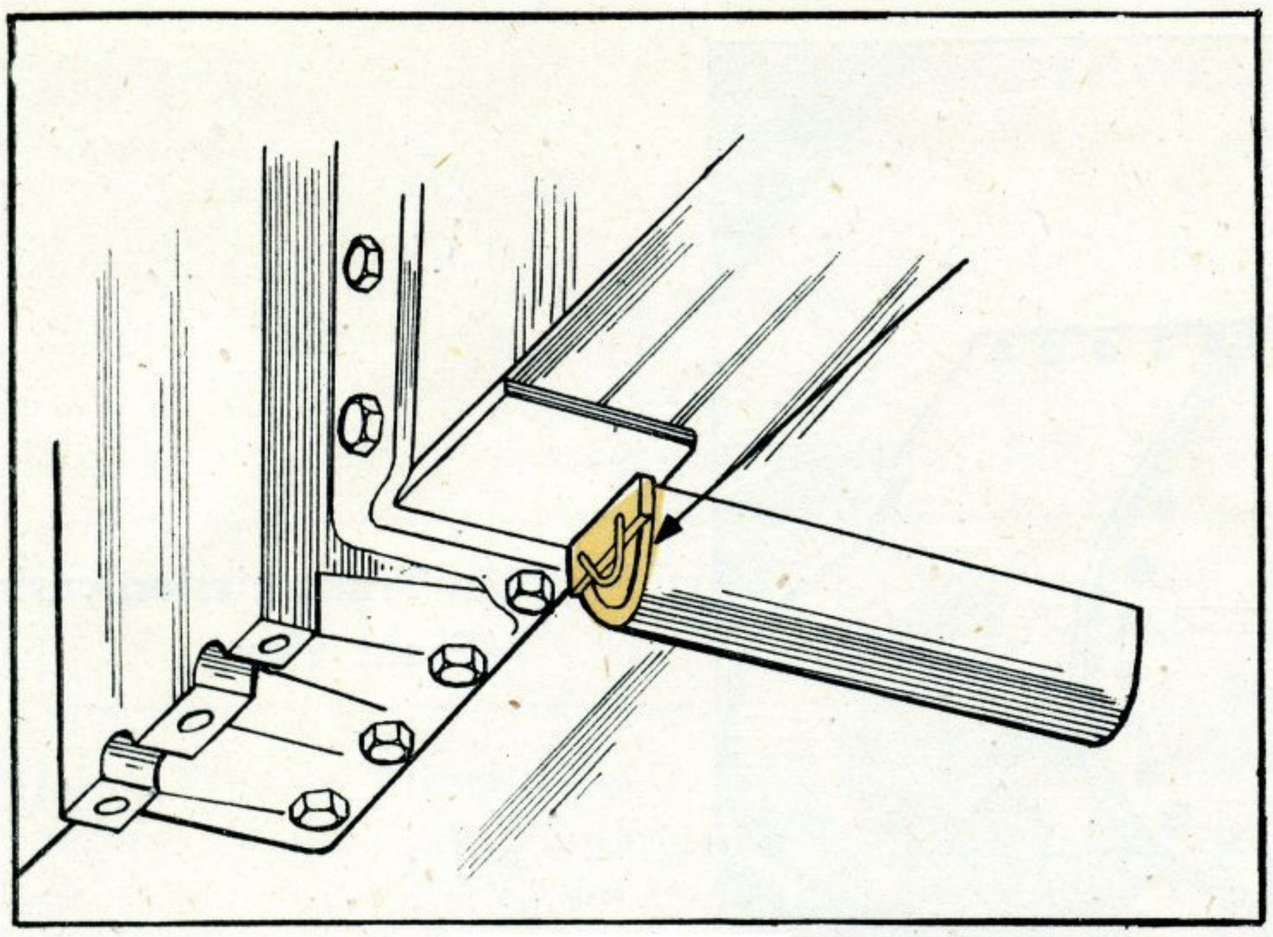


Fig. 11. Sealing transverse channel.

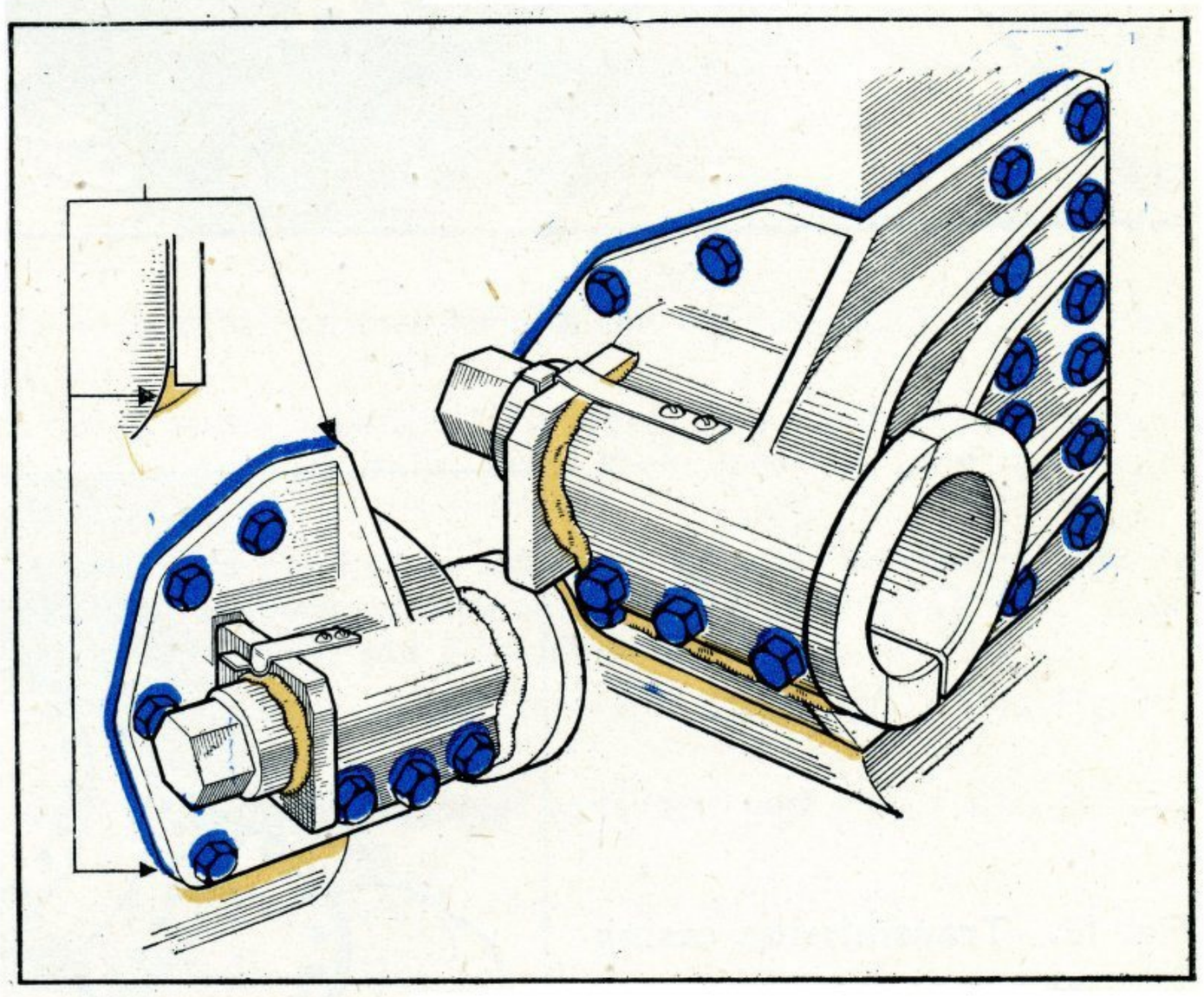


Fig 12. Idler bracket.

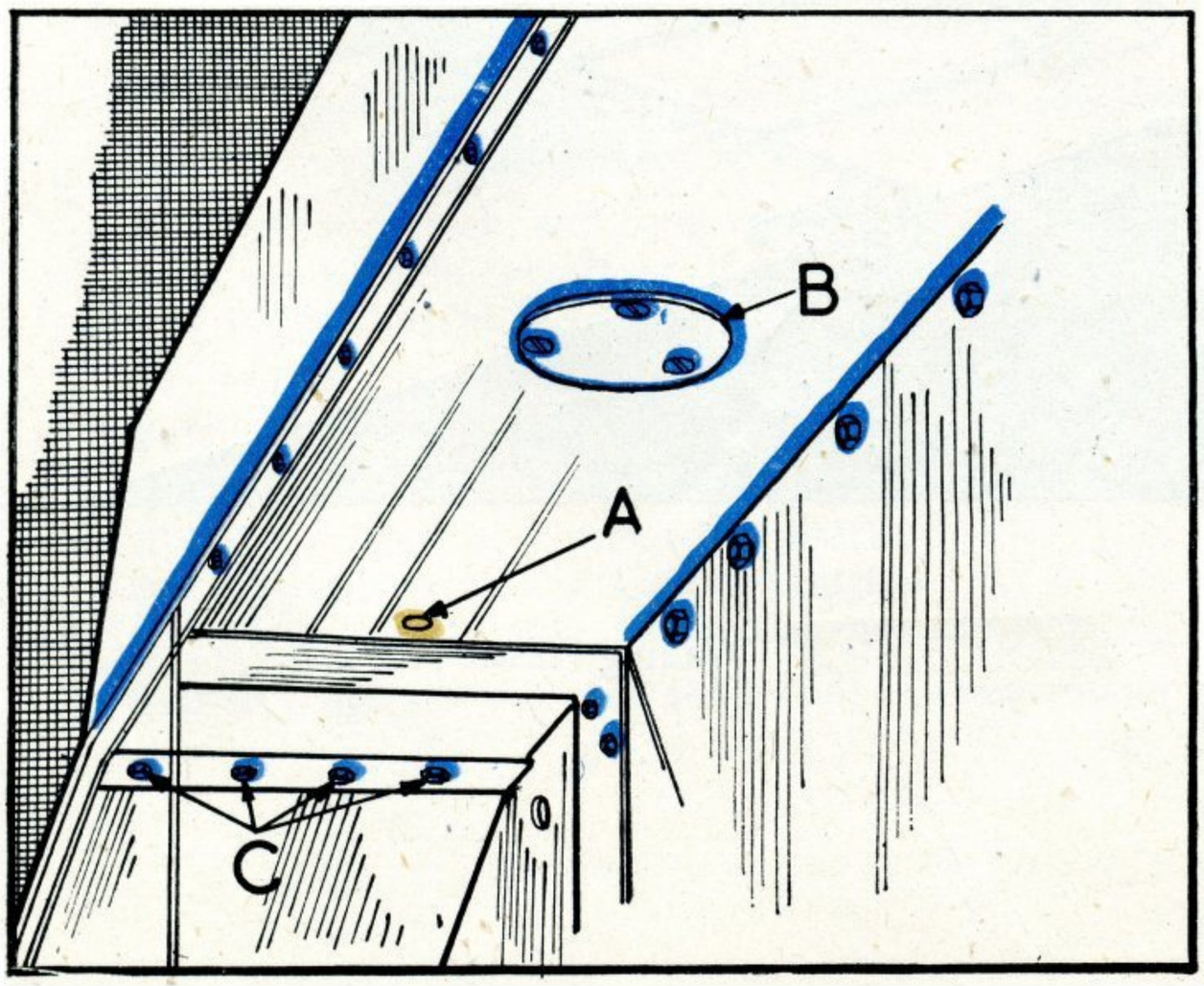


Fig. 13. Sponson floor.

Bostik (see Text).

Wading Plastic No. 2.

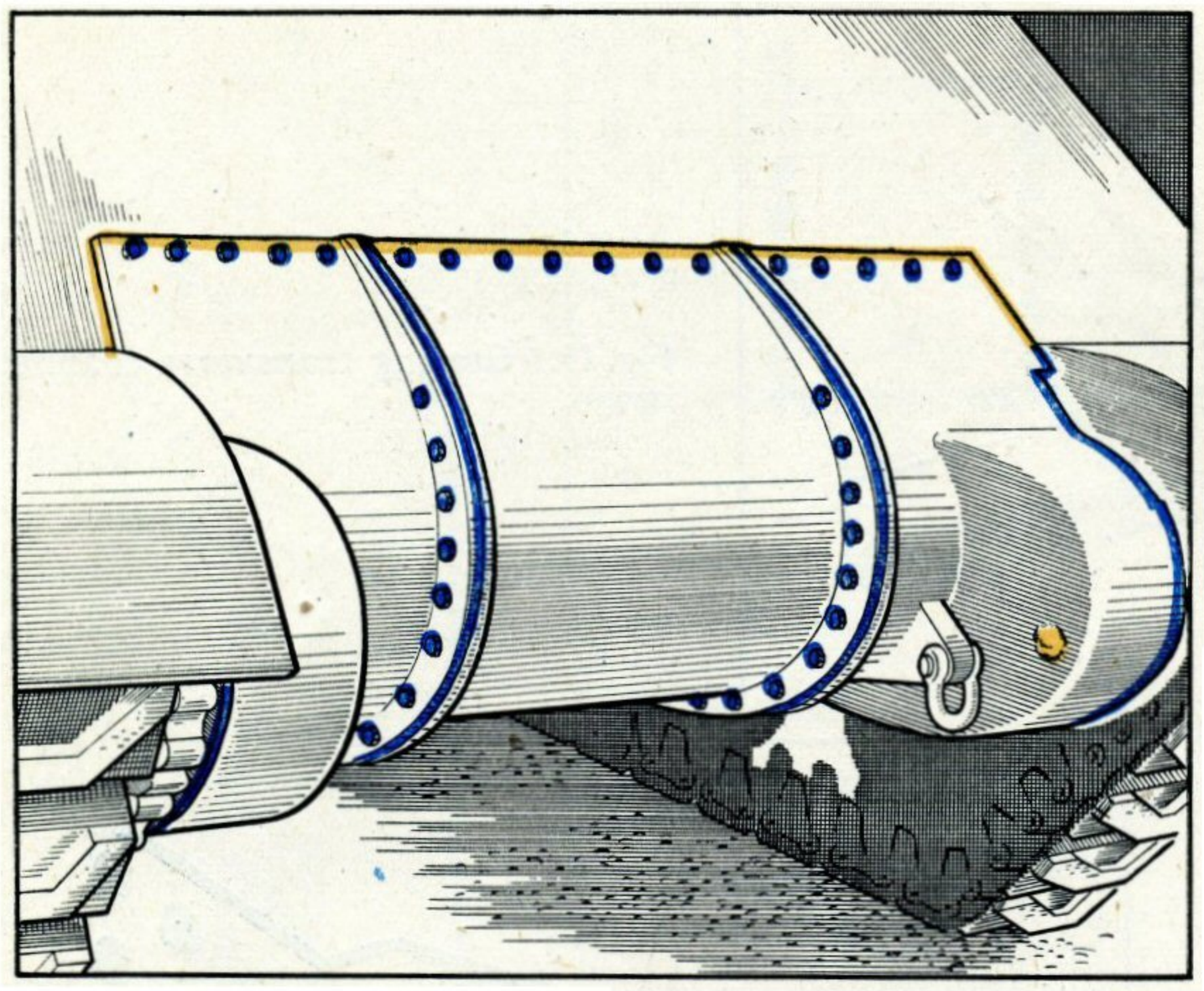


Fig. 14. Transmission casing (Front view).

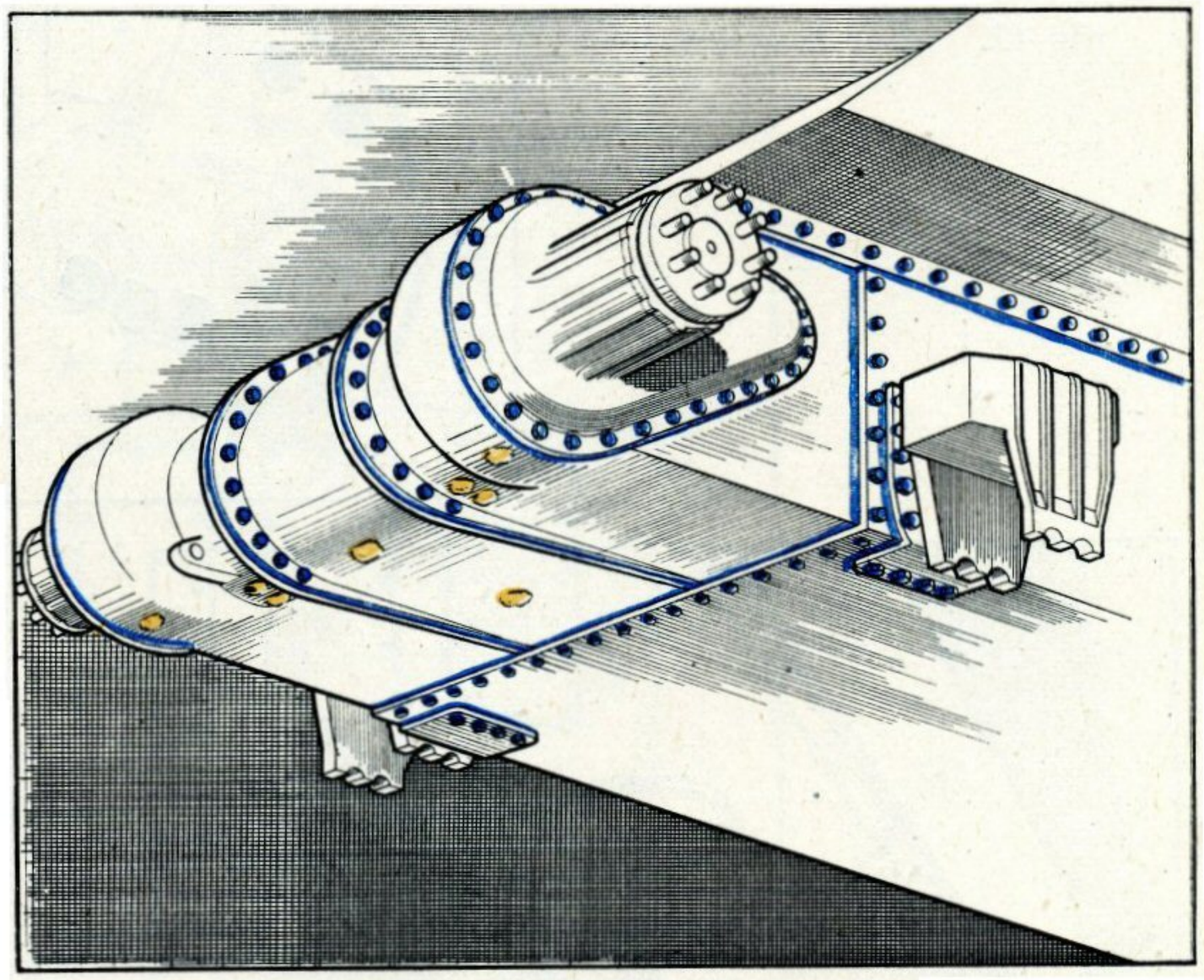


Fig. 15. Transmission casing and sprocket hub.

Bostik (see Text).

Wading Plastic No. 2.

TASK 3

SEALING LOWER HULL

Materials required :—

Bostik cleaner.
Wading Plastic No. 2.
Bostik 89 AA.
Bostik 89 AA tube.
Boscoprene " A " and " B."

Use a rag or piece of cotton waste soaked in Bostik cleaner to clean each joint immediately before applying the sealing compounds.

1. Using Wading Plastic No. 2

NOTE.—Before sealing with plastic, apply a priming coat of Bostik 89 AA, except where otherwise stated. Allow the Bostik to dry thoroughly before using the plastic.

(*a*) Seal each end of the transverse channels marked " B " in Fig. 10 by plugging as shown in Fig. 11.

Make certain that the plastic is firmly packed around the wire loop, and pressed down on to the outside of the channel.

(*b*) Seal the bottom edge of each idler bracket as shown in Fig. 12.

(*c*) Plug the drain holes in the sponson floor, marked " A " in Fig. 13, and in bottom plate, marked " C " in Fig. 10.

Use a plug of plastic large enough to extend half an inch around the edge of each hole, and press it firmly into the aperture.

(*d*) Seal the joint of the transmission casing to the upper hull (Fig. 14). Thoroughly clean any trace of oil from this point. Then roll the plastic into long thin rolls, press them into the joint, and build up to ensure that there are no gaps in the plastic.

(e) The space between the bogie brackets and the hull is already filled with petroleum jelly by the manufacturer. As this will destroy the plastic at joints, remove the jelly to a depth of $1\frac{1}{2}$" to 2" from each corner between bracket and hull, clean thoroughly, and fill with plastic (Fig. 18).

(*f*) Plug with plastic all gaps more than $\frac{1}{8}$" wide between the transverse channels (" B " in Fig. 10) and the bottom plate.

NOTE.—Any other large gaps in hull seams (i.e. *over* $\frac{1}{8}$" *wide*) *must be plugged with plastic after priming with Bostik 89 AA.*

(*g*) All plugs and plates marked " X " in Fig. 10 by covering completely with plastic.

(*h*) Seal six dump valves, marked " Y " in Fig. 10, as follows :—

(i) Open valve, clean seating, and apply a thin layer of plastic on the seating. DO NOT PRIME WITH BOSTIK.
(ii) Close valve and cover completely with plastic.

(*i*) Seal escape hatch as follows :—

(i) Remove hatch, and remove gasket from hatch (see Fig. 16).
(ii) Apply a thin even layer of plastic on to the seating for gasket, and replace gasket. DO NOT PRIME WITH BOSTIK.

NOTE.—If the gasket is a poor fit, ignore (ii) and instead, stick the gasket to the hatch with Bostik 89 AA. If the gasket has stretched, it will be necessary to cut it to fit. Be sure it is rejoined without a gap.

(iii) Fill groove in gasket with plastic.
(iv) Replace hatch and lock in position.
(v) Make fillet of plastic all round edge of hatch.

(*j*) Seal all plugs and exposed shaft ends in transmission case (see Fig. 15).

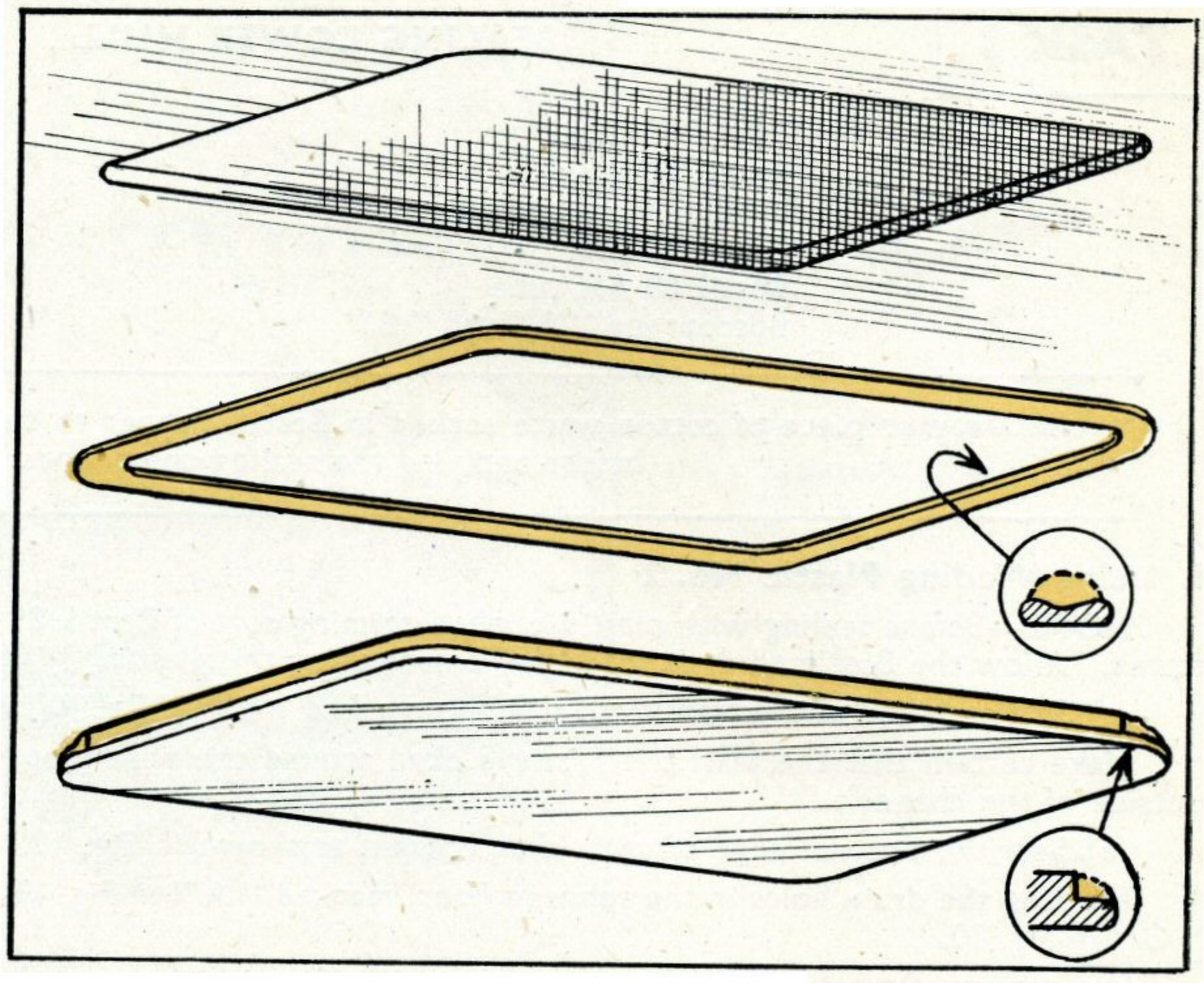


Fig. 16. Escape hatch.

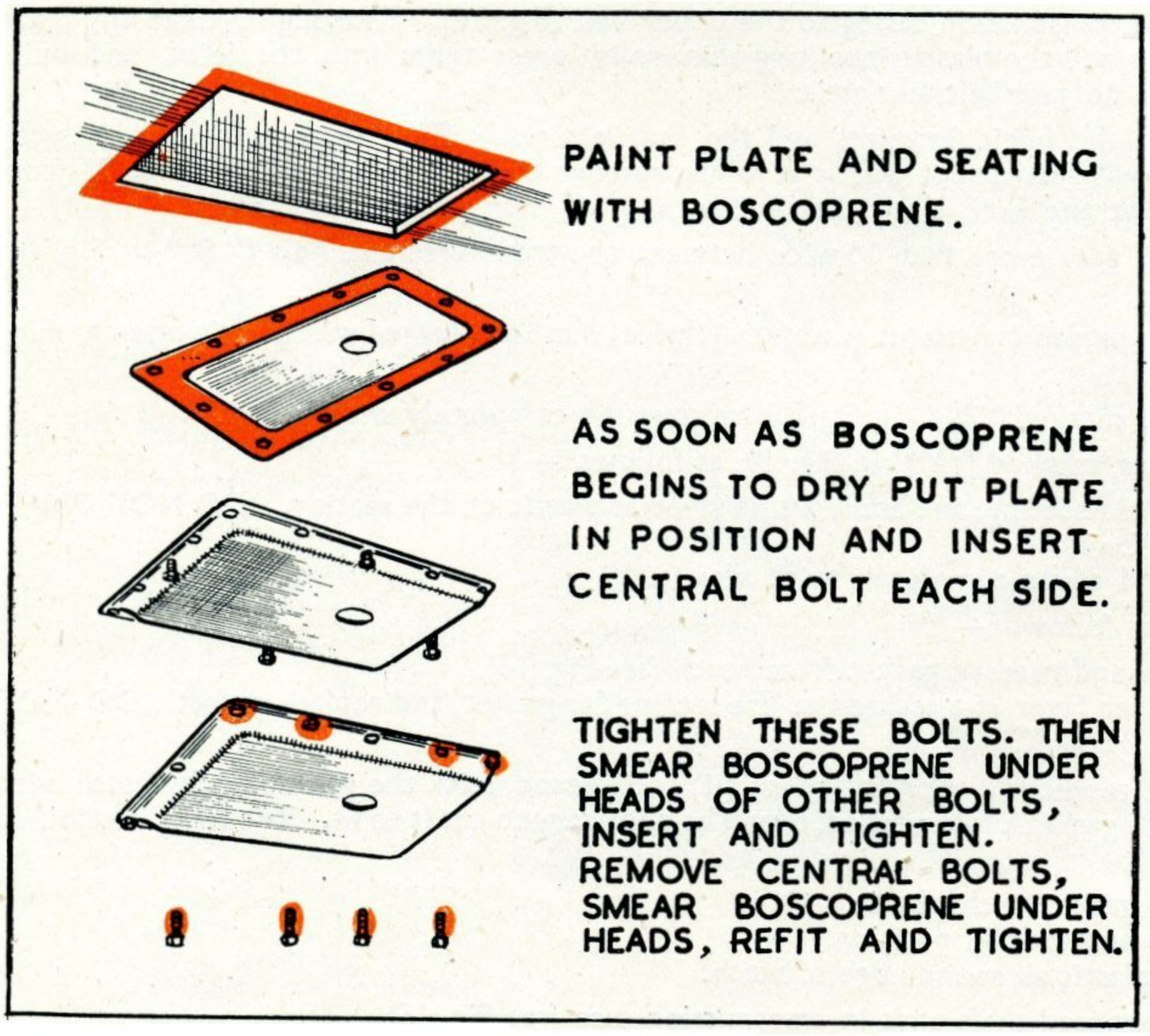


Fig. 17. Sealing access plate.

Wading Plastic No. 2.

Boscoprene.

2. Using Bostik 89 AA/tube

(*a*) Seal each joint of the transmission casing to the hull bottom plate and lower side plates (Figs. 14 and 15).

(*b*) Seal each vertical joint in the transmission casing.

> REMEMBER—To make a good seal in angles or corners, press Bostik 89 AA or 89 AA/tube into place with your finger or a putty knife. When sealing a rivet or bolt by painting with Bostik 89 AA it is the joint round the bolt or rivet head which must be sealed.

3. Using Bostik 89 AA

Paint Bostik AA over the following items :—

(*a*) **Bottom Plate** (*see* Fig. 10)
All bolts and screw heads.
All welded seams.

(*b*) **Bogie and Idler Brackets** (see Figs. 18 and 12)
Round edges and over attachment bolts.

(*c*) **Transmission Case** (see Figs. 14 and 15)
Over joints of final covers to case.
Over plastic at joint of case to upper hull.
Over joints between the sections of the case.
Over Bostik 89 AA tube sealing.
Over all bolts on the case, and attaching case to hull.
Reassemble front mudshields, painting bolts with Bostik AA.

(*d*) *Seal outside flange of final drive casing with Bostik 89 AA on joint gasket and boltheads.*

(*e*) **Sponson floors.**
Over all bolts and screw heads.
Over all welded seams, *i.e.*, seams of sponson floor to lower hull side plates, and of sponson floor to upper hull side plates, including both edges of angles which support the sandshields (see Fig. 13).
Around access plates marked " B " in Fig. 13 and over attachment screws of these plates.

4. Using Boscoprene

Seal the four access plates on the bottom plate marked " A " in Fig. 10.

NOTE.—This must not be done until all work in the engine compartment has been completed.

(*a*) Discard cork gaskets.
(*b*) Clean seatings on hull bottom plate and access plates with Bostik cleaner.
(*c*) Mix Boscoprene by pouring the contents of the bottle into the tin, and stirring well. Then paint with Boscoprene the seating on access plate and on hull bottom plate (see Fig. 17).

IMPORTANT.—Item (c) must be done by three men, so that both the access plate and the hull bottom plate are painted at the same time. The Boscoprene will begin to dry off within a couple of minutes, and the plate should be put in position and attached by inserting the centre bolt each side and tightening it up.

(*d*) Insert the remaining bolts, first smear Boscoprene under each bolt head. Tighten these bolts.
(*e*) Remove the first four bolts to be inserted, smear Boscoprene under the heads, replace and tighten.
(*f*) Inspect for missing bolts, replace as necessary and seal with Bostik 89 AA.
(*g*) When the plate is securely fastened, smooth off any Boscoprene exuding round the edge.
(*h*) Finally run an adequate fillet of Bostik 89 AA/tube round the edge of each plate and paint Bostik 89 AA over the attachment bolts.

SURFACES MUST BE CLEAN AND DRY

TASK 4

FITTING AIR EXIT ADAPTORS AND COVER PLATE
(Rehearsal)

Open the drawbar clamp on rear of left hand mudguard.

Place the left hand air exit adaptor in position with the flange on top of the angle welded to the rear hull plate, and the side flange under the side angle. Support the adaptor by means of two 4″ bolts through the transverse strip on adaptor and the lugs welded to sloping rear protection plate (see Fig. 21). Use a $1\frac{1}{2}'' \times 1\frac{1}{2}''$ washer plate under the head of each bolt.

Bolt the side flange of adaptor to the angle, using $1\frac{1}{2}'' \times 1\frac{1}{4}''$ washer plates between the bolt heads and the underside of adaptor flange and also between the welded angle and the nuts.

Bolt the forward flange of the adaptor to the welded angle, with the loose 18″ washer strip between the bolt heads and the angle. Four bolts only will be used at this stage, the hole nearest to engine access door being left open for securing the horizontal cover plate. Insert $1\frac{1}{2}'' \times 1\frac{1}{4}''$ washer plates between the adaptor flange and the nuts on the four bolts.

Secure the right hand adaptor similarly.

Assemble the cover plate between the two adaptors, securing with set bolts to the angle welded to rear hull plate and to the inner flange of each adaptor. Use a 13″ washer plate at each side of cover plate. Finally, secure the cover plate to the welded lugs by means of two 4″ bolts, each with $1\frac{1}{2}'' \times 1\frac{1}{2}''$ washer plate under the head (see Fig. 22).

The holes in cover plate are oversize, but it still may be found necessary to " draw " some holes, due to variation in rear hull dimensions.

Having ensured a satisfactory fit, remove the cover plate and adaptors.

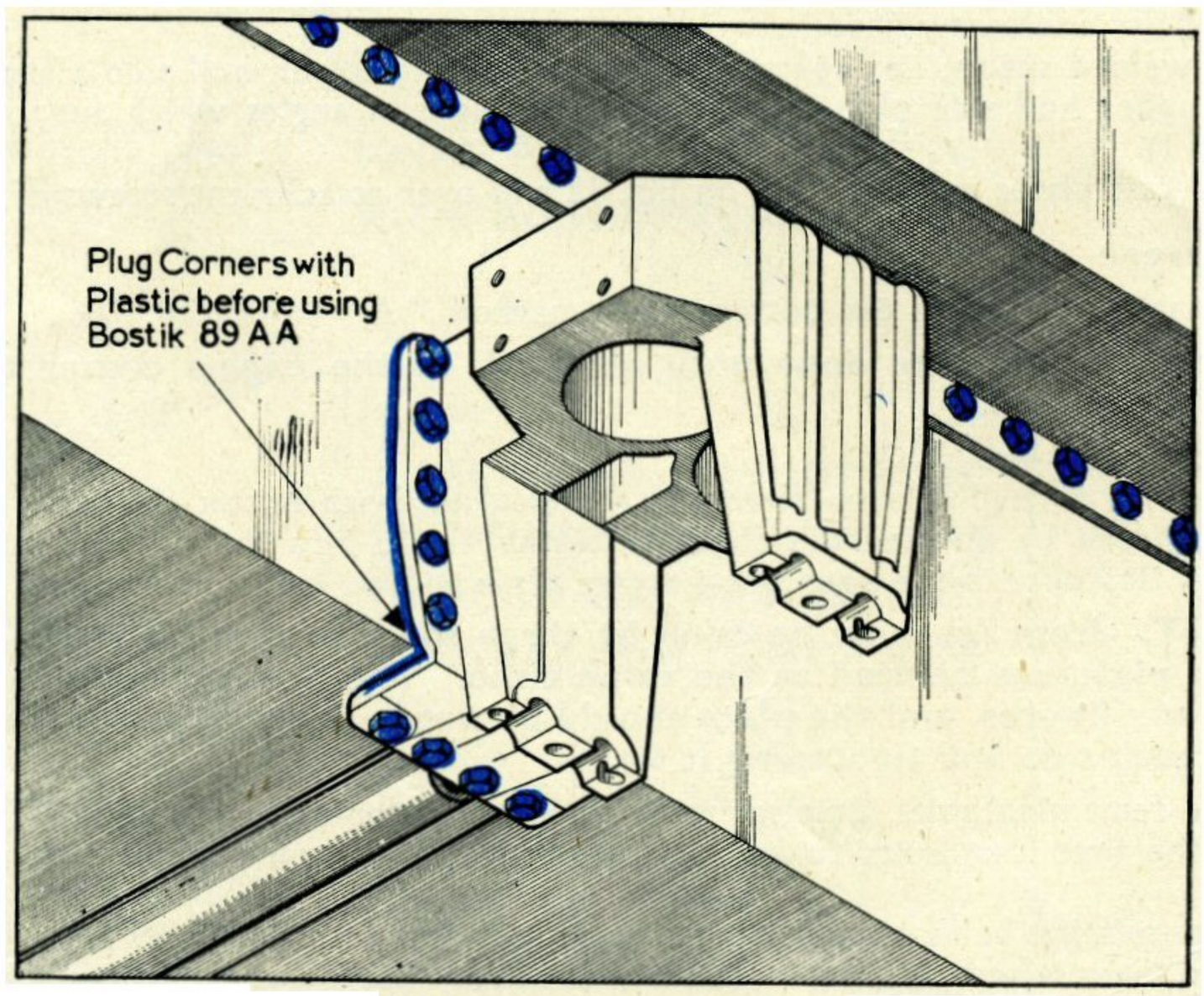


Fig. 18. Bogie bracket.

Bostik (see Text).

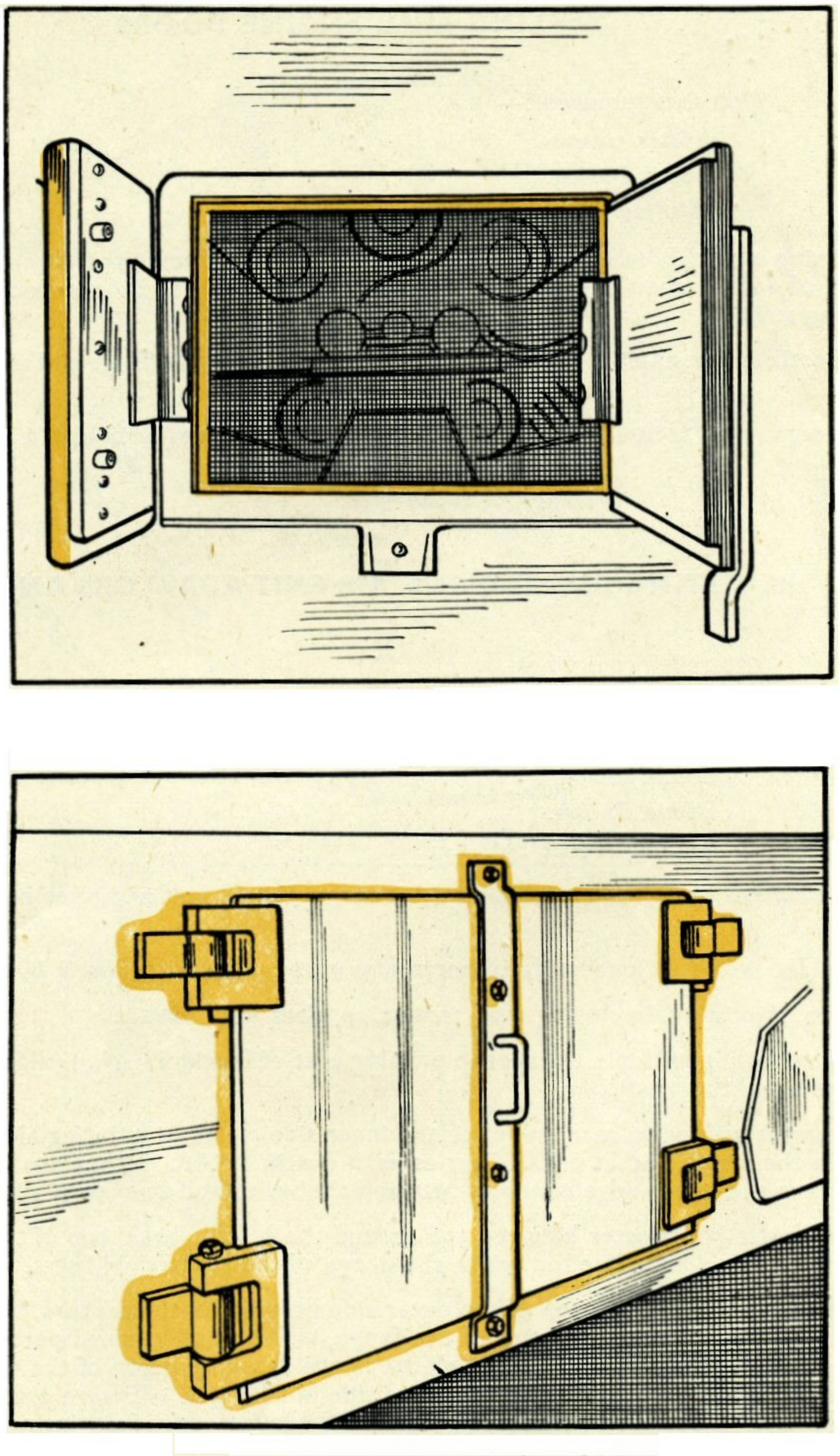


Fig. 19. Sealing rear engine doors.

Wading Plastic No. 2.

TASK 5 — SEALING REAR ENGINE DOORS

Materials required :—

Bostik cleaner.
Bostik 89 AA.
Wading Plastic No. 2.

Apply a priming coat of Bostik 89 AA around the seating flange, down the edge of L.H. door, around the outer edges of doors, when closed, including over and around the hinges, and over and alongside the centre bolting strip.

When the Bostik is dry, apply a bead of plastic all round the seating flange and along the edge of L.H. door.

Close the doors, bolt securely and complete the sealing externally over the Bostik priming (see Fig. 19).

TASK 6 — RE-FITTING AND SEALING AIR EXIT ADAPTORS AND COVER PLATE

Materials required :—

Air Exit Adaptors.
Cover Plate.
Bostik cleaner.
Bostik 89 AA.
Wading Plastic No. 2.

Prepare the adaptors by painting over all welded seams and all bolt and rivet heads externally with Bostik 89 AA.

Paint the welded seams on underside of horizontal cover plate with Bostik 89 AA.

Plug the holes, if existing, in sloping rear protection plate with plastic.

NOTE.—Before sealing with plastic, apply a priming coat of Bostik 89 AA. Allow the Bostik to dry thoroughly before using the plastic.

Prepare the angles welded to rear hull plate and inner side plates by painting along the lower edge, over and between the welds, and at ends of angles with Bostik 89 AA. When the Bostik is dry, place fillets of plastic along the lower edge of angles between the welds and at ends of angles.

Lay a fillet of plastic $\frac{1}{4}$" diameter between and around the bolt holes on top of the horizontal flange of the angle welded to rear hull plate, on which the flange of the adaptor will seat.

Place a similar fillet of plastic on top of the outer side flange of both adaptors, between and around bolt holes, continuing the fillet to both ends of the flange, including the shaped portion adjacent to the transverse strip. Place a generous thickness of plastic in the shaped portion of the flange, and a similar pad of plastic across the shaped flange on the opposite side of adaptors. Ensure that there is sufficient plastic to make a good seal between the shaped flange and the lower edge of sloping rear protection plate.

SURFACES MUST BE CLEAN AND DRY

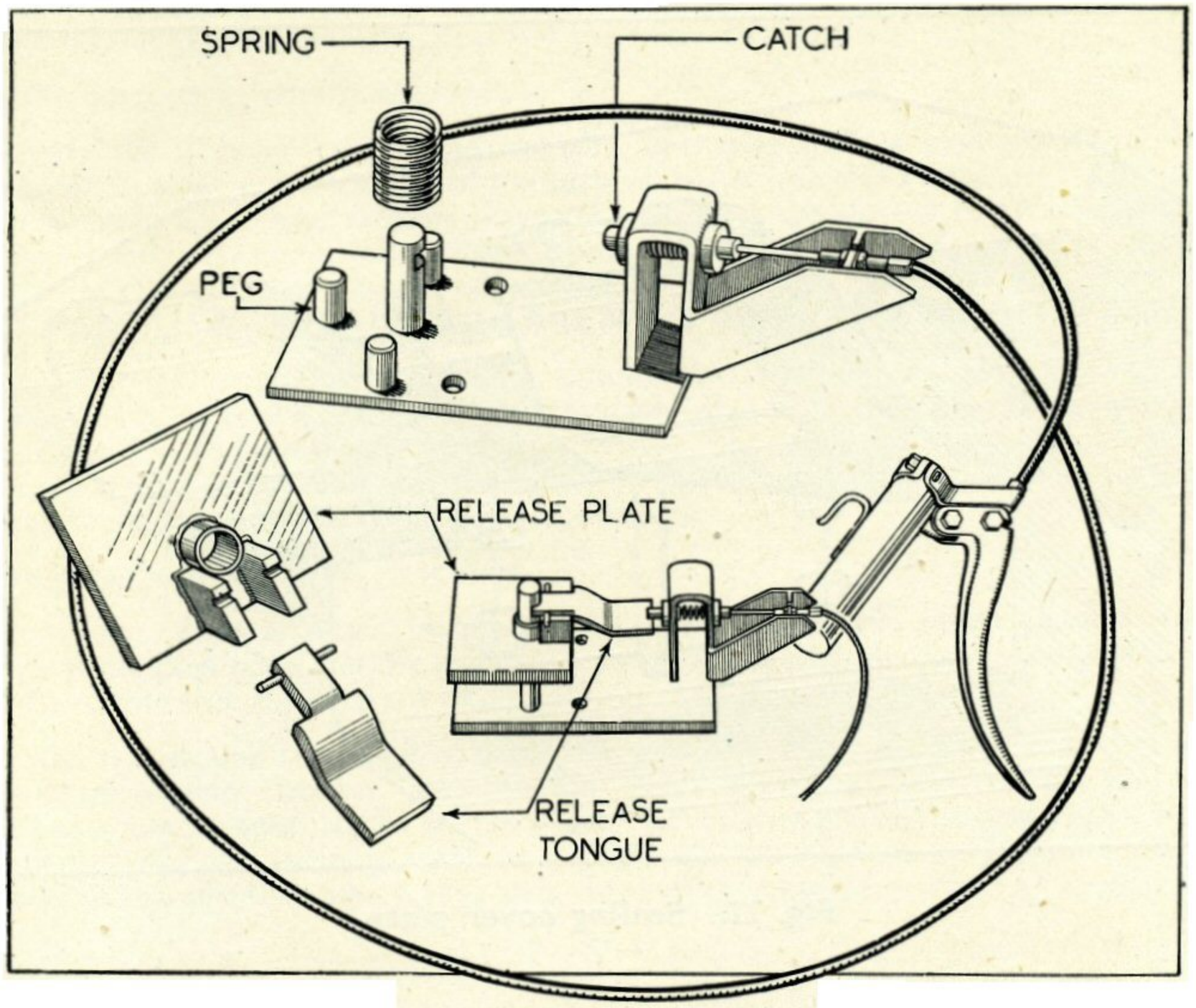


Fig. 20. Release gear.

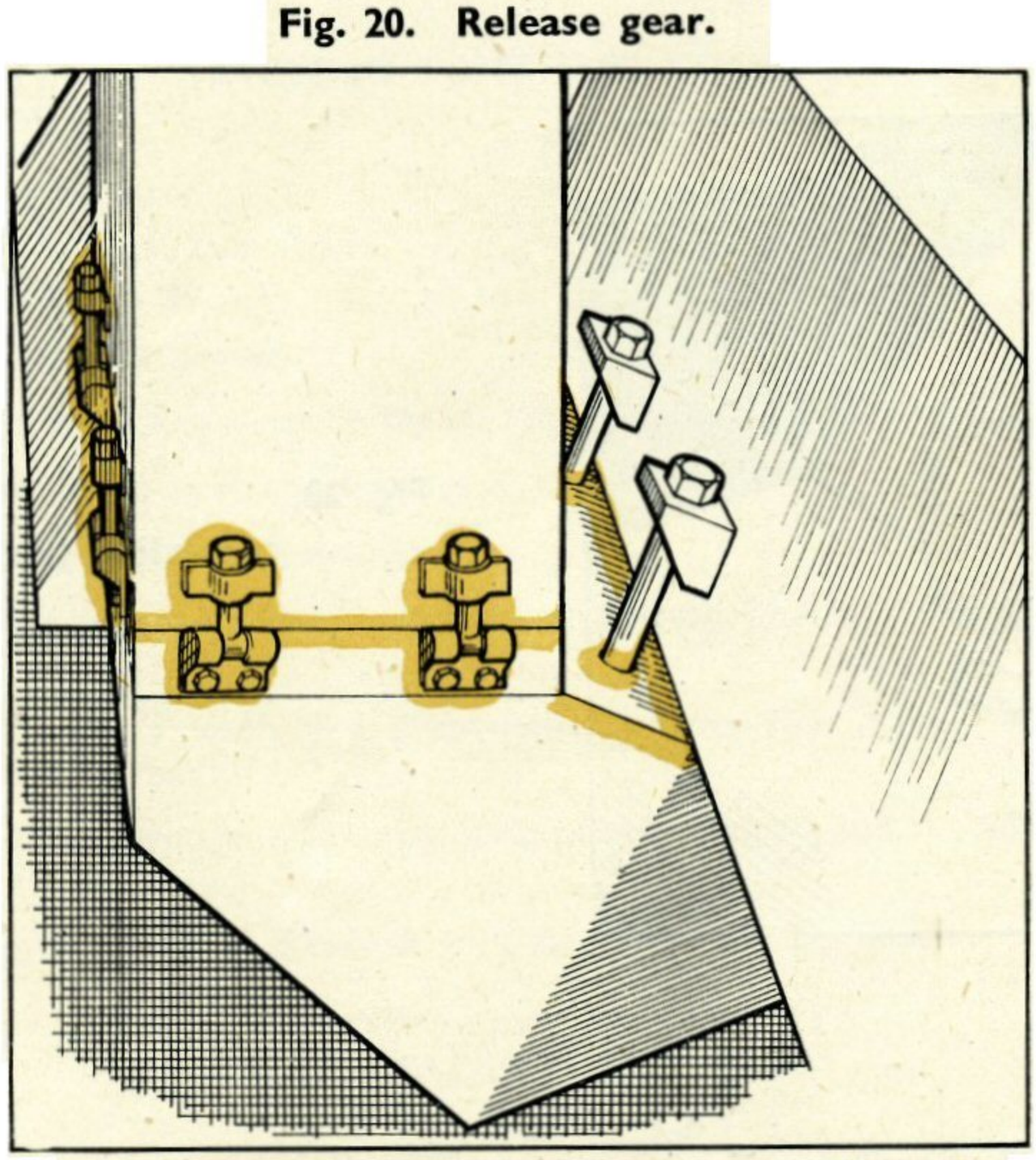


Fig. 21. Sealing Air Exit Adaptors and Stacks.

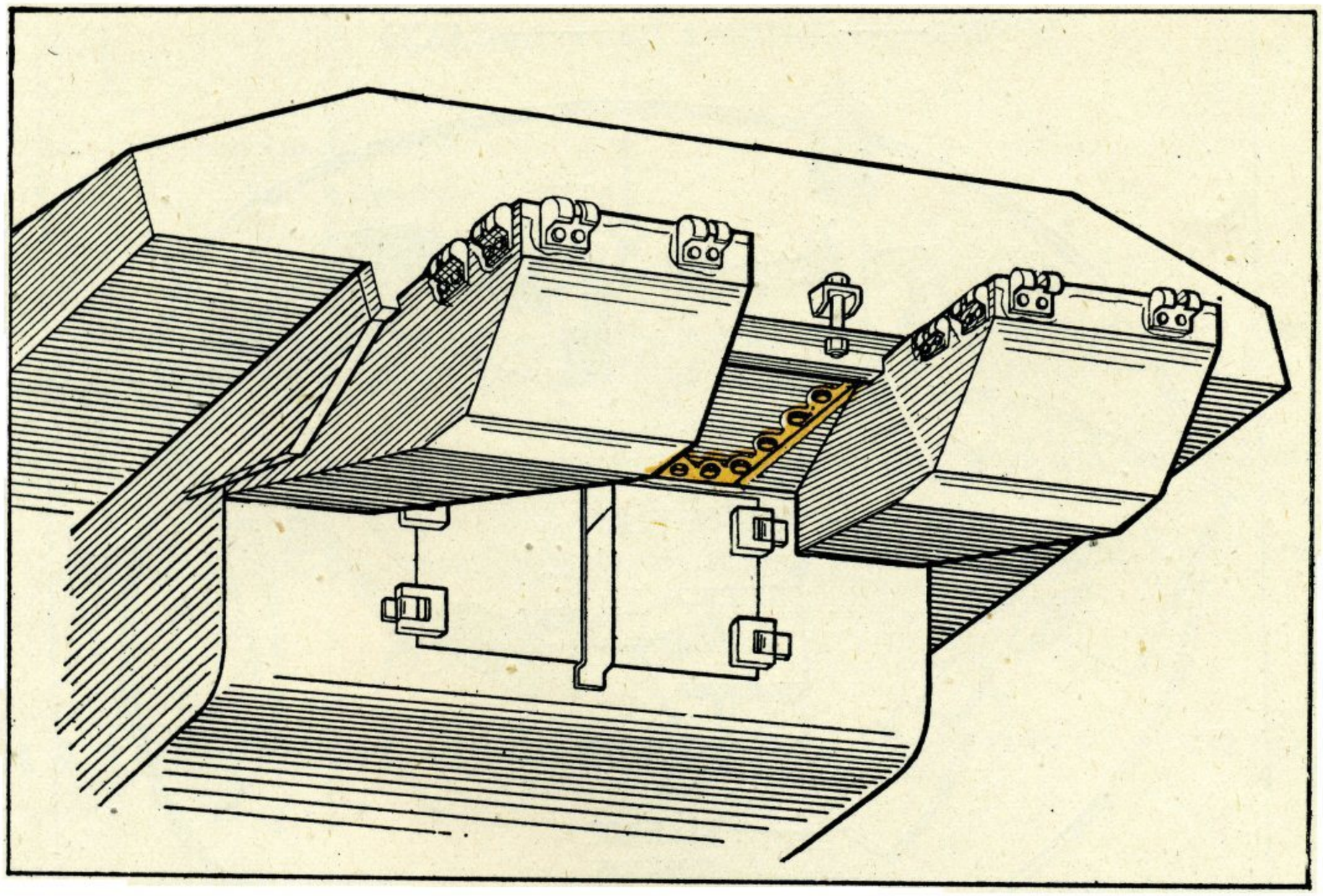


Fig. 22. Sealing cover plate.

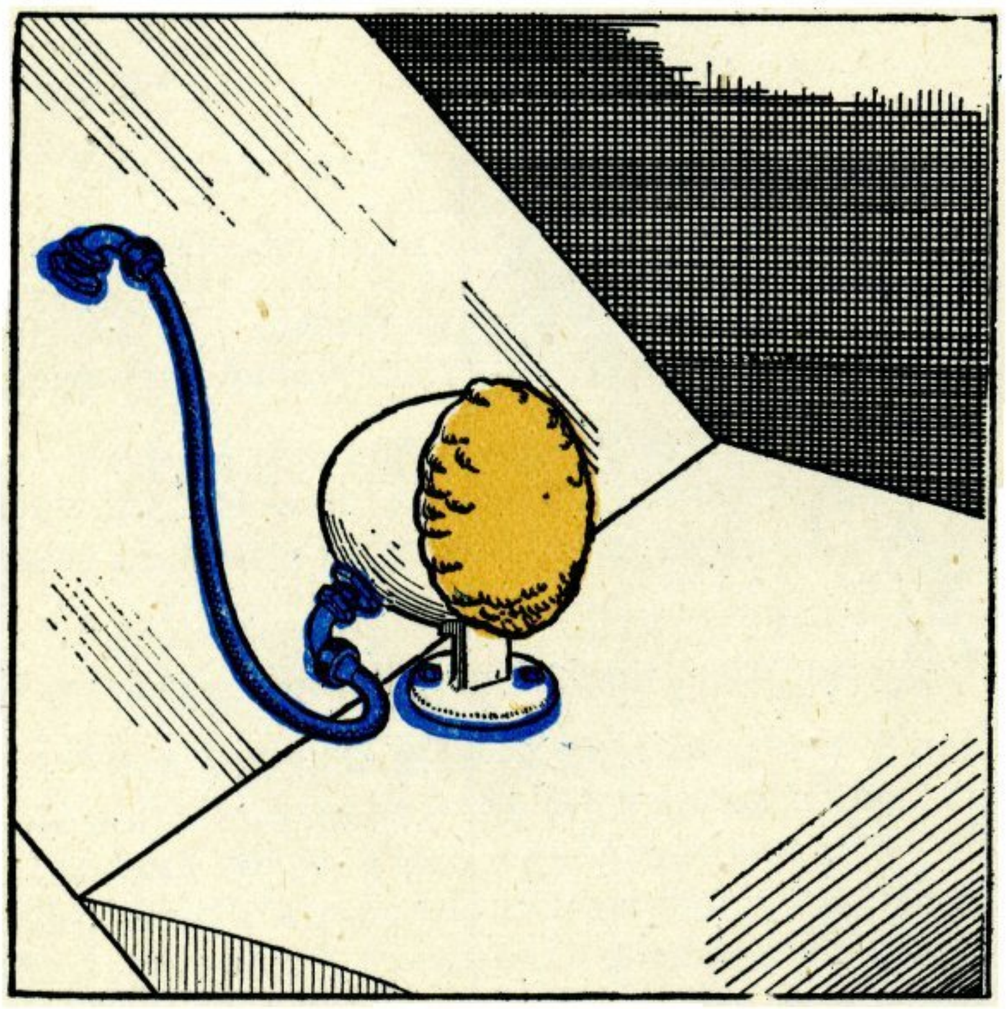


Fig. 23.

Sealing horn.

Bostik (see Text).

Wading Plastic No. 2.

Press a fillet of plastic into the grooves between the ends of transverse strip and the sides of adaptors (see Fig. 21) and fill the gap between the strip and the outer shaped flange.

Assemble the adaptors as already described.

Thoroughly tighten all bolts securing the adaptors, so that as much as possible of the plastic in the joints is expressed. Feather out the edges of the surplus plastic inside the adaptors. Ensure that there is a good seal at the remote outer corners where the adaptors are slotted to clear the welded angle. To do this, press small, thoroughly workable portions of plastic into the slot around the angle, build up with more plastic, and feather out the edges. **SEALING IS DIFFICULT IN THIS CORNER, AND EVERY PRECAUTION MUST BE TAKEN TO ENSURE A GOOD SEAL.**

Before finally assembling the cover plate, lay a continuous fillet of plastic, $\frac{1}{4}$" diameter, along both sides and the edge adjacent to the rear hull plate, between and around the holes for set bolts. This fillet is to be on the upper face to make a watertight joint between the cover plate and the adaptors and welded angle. It must be uniform in thickness and continuous along the whole of the flat surface up to the welded " pocket " over the centre of the engine access doors.

Secure the cover plate as already described.

Press a continuous fillet of plastic into the angle formed externally between the bottom edge of the sloping rear protection plate and the transverse strips of the adaptors and upper face of cover plate (see Fig. 21). Take care that any gaps are well filled.

Using plastic, seal around the edges of the cover plate (see Fig. 22), taking care that a good joint is made between the welded " pocket " and rear hull plate. Press the plastic into the gaps between the cover plate and adaptors, adjacent to the welded angle. Cover with plastic the heads of set bolts securing the cover plate, and of bolts securing adaptors to angle on rear hull plate. Seal similarly around the 4" bolts supporting the adaptors where they pass through the transverse strip on top of the adaptors (see Fig. 21).

TASK 7 — FITTING JOINTING STRIPS

Materials required :—

Relt jointing strips.
Bostik 89 AA.
Bostik cleaner.

Fit jointing strips to the stack seatings on the air inlet stack base and the air exit adaptor as follows :—

(i) Sort out the relt strips to fit the seatings.

(ii) Clean the seatings with Bostik cleaner.

(iii) Paint one side only and the ends of each strip with Bostik 89 AA. Paint the seatings with Bostik 89 AA.

(iv) When Bostik 89 AA is nearly dry, press jointing strips into place. Make sure there are no gaps where the strips abut.

(v) Paint the joints between the transverse strip of the adaptors and the adjacent relt seating with Bostik 89 AA.

Do not allow the Bostik to come into contact with the upper face of the relt.

SURFACES MUST BE CLEAN AND DRY

TASK 8

ERECTION OF AIR INLET STACK
(Rehearsal)

Secure the release gear stand by bolting the legs to the brackets welded to the hull (see Fig. 38).

Bolt the release gear (Fig. 20) to the top of the stand with the Bowden cable towards the front of the vehicle.

NOTE.—When operating the release gear attach the release tongue to the stand by a length of string, as a precaution against loss.

Stand the air inlet stack in position, and assemble the T bolts with the heads under the slotted lugs on the air inlet stack base.

Lightly tighten the T bolt.

Attach the straining rod to the stack.

Remove the release plate from the release gear, by operating the handle. Hold the plate while depressing the handle, so that the plate will not fly off. Put the straining rod over the release gear peg, and replace the release plate and tongue.

Tighten the T bolt sufficiently to compress the relt strip slightly, then adjust the turnbuckles on the straining rod to bring the stack on to an even seating.

Alternately tighten the T bolts and turnbuckles a little at a time, keeping the stack on an even seating until the relt strips are compressed about $\frac{1}{8}$".

The stack must not be screwed down so tightly that no "give" is left in the jointing strips.

CHECK THE RELEASE GEAR FOR OPERATION.

Stand by to prevent the stack falling to the ground, and operate the release gear.

The stack may not fall when the vehicle is stationary, but so long as the straining rod springs off the release gear peg, operation of the release gear is satisfactory.

Coil the Bowden cable of the release gear, and secure as convenient. *Do not coil the cable tightly. Avoid a sharp bend where connected to the release gear.*

TASK 9 ERECTION AND SEALING OF AIR EXIT STACKS

Materials required :—

Bostik cleaner.

Bostik 89 AA.

Wading Plastic No. 2.

Paint with Bostik 89 AA over rivet heads and welded seams below the top opening of the stacks.

Erect the stacks on the adaptors, and secure with T bolts, head downwards, under the slotted lugs on the adaptors (see Fig. 21). Lightly tighten each T bolt.

Attach the straining rods to the hooks welded on top of the hull and to the bracket on top of the stacks. Use a nut and washer above and below the bracket.

Adjust the tension on T bolts and straining rods until the relt jointing strips are compressed about $\frac{1}{8}$".

Avoid over-compression of the relt.

Apply a priming coat of Bostik 89 AA around the top of the adaptors and base of the stacks, but do not allow the Bostik to come into contact with the relt.

When the Bostik is dry, seal around the joints between stacks and adaptors, and over the T bolts with plastic (see Fig. 21).

TASK 10 — COMPLETION OF LOWER HULL SEALING

Materials required :—

2 fabric patches, 5″ × 5″.
Bostik 89 AA.
Wading Plastic No. 2.
Bostik cleaner.

(*a*) **Electric Horn** (if fitted)

Paint the flexible cable and unions and elbows at each end of the cable with Bostik 89 AA.

Paint a priming coat of Bostik 89 AA around the forward edge of the body of the horn, extending behind the apertures in the body. Do not apply the Bostik over the front of the horn. When the Bostik is dry, seal the horn by applying a disc of Wading Plastic No. 2 over the front. Carry the plastic over the edge so as to cover the apertures in the body of the horn (see Fig. 23).

(*b*) **Sandshields**

First cover with a 5″ × 5″ fabric patch the plastic sealing of drain holes marked "A" in Fig. 13. Clean around each hole with Bostik cleaner and paint with Bostik 89 AA, also paint one side of fabric with Bostik 89 AA. When Bostik 89 AA is nearly dry, press fabric in place. Now replace all sandshields. When inserting bolts, marked "C" in Fig. 13, paint around each bolt hole with Bostik 89 AA. After tightening each bolt, paint over head with Bostik 89 AA.

(*c*) **Replace Sprockets and Re-make both Tracks**

If more convenient, this may be done before the completion of item (*b*).

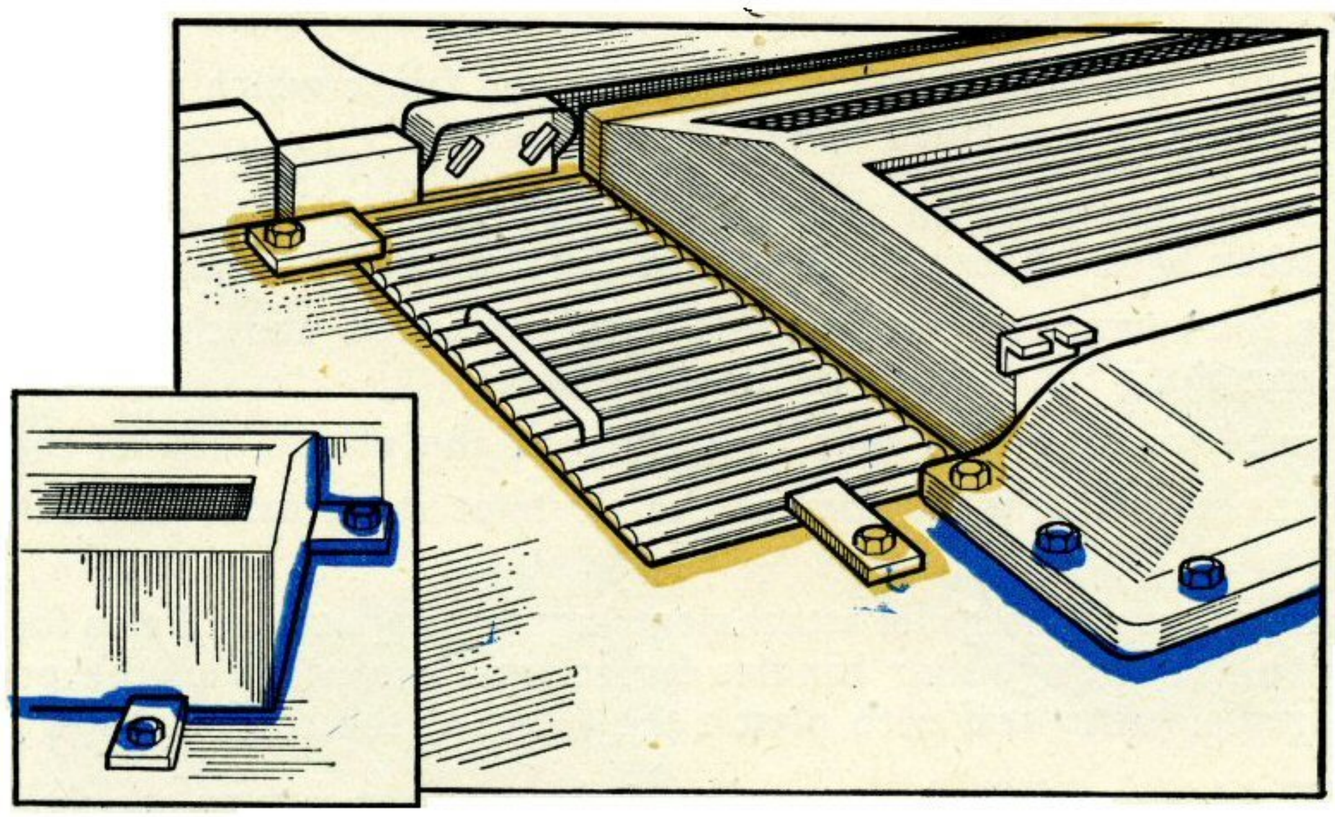


Fig. 24. Sealing air inlet grille.

SURFACES MUST BE CLEAN AND DRY

Bostik (see Text). Wading Plastic No. 2.

TASK 11 — ARMAMENT MAINTENANCE

Co-Driver's Machine Gun

Remove the gun and oil the bore and chamber.

Feed a pull-through, from the muzzle end, through the bore. Pass through the loop a piece of clean dry rag, large enough to fit firmly in the muzzle.

Pull on the pull-through, and ensure that the rag forms a tight bung in the muzzle, capable of being pulled through the bore.

Replace the machine gun.

4" Smoke Generator Discharger (if fitted). Fit the muzzle cover to the discharger, seal around the cover with Wading Plastic No. 2 and thoroughly smear Grease G.S. over all working parts.

TASK 12 — SEALING AIR INLET GRILLE

Materials required :—

Wading Plastic No. 2.
Bostik 89 AA.
Bostik cleaner.

(*a*) Seal all around the air inlet grille with plastic ; this requires GREAT CARE (see Fig. 24). The seam along the front and back and both ends of the grille must be sealed. Also seal the seams where the air inlet stack base is attached to the grille. The base is only tack welded in position and plastic must be used between the welds.

In addition, a seating must be built up of plastic for the fabric which will be placed over the grille during Stage 2 of the sealing, as described below.

Before applying the plastic, paint on a priming coat of Bostik 89 AA, and also paint over the welds securing the air inlet stack base. Allow the Bostik to dry thoroughly before applying the plastic.

(i) First traverse the turret so that the grille is fully exposed, and check that it is securely bolted in place. Clean along the seams with Bostik cleaner.

(ii) Roll plastic out into long thin rolls. Firmly pack the plastic into all the seams (see Fig. 24).

(iii) Build up plastic around the bottom of the air inlet stack base, particularly on the left-hand end (again see Fig. 24).

(iv) Smooth off the edges of the grille attachment lugs with plastic, and also form a seating of plastic in front of the fire extinguisher handles for at least the width of the protection plate at the front of the grille. Also seal with plastic the joints of the stack base to this protection plate.

(*b*) Paint Bostik 89 AA around the bottom edge of the radiator cover plate ; then replace the cover. Bolt it securely in place, and paint Bostik 89 AA round the base of the cover and over the attachment bolts.

Build up a bridge of plastic across to the LEFT HAND corner of the radiator cover, as Fig. 24.

SURFACES MUST BE CLEAN AND DRY

TASK 11 — ARMAMENT MAINTENANCE

Co-Driver's Machine Gun

Remove the gun and oil the bore and chamber.

Feed a pull-through, from the muzzle end, through the bore. Pass through the loop a piece of clean dry rag, large enough to fit firmly in the muzzle.

Pull on the pull-through, and ensure that the rag forms a tight bung in the muzzle, capable of being pulled through the bore.

Replace the machine gun.

4" Smoke Generator Discharger (if fitted). Fit the muzzle cover to the discharger, seal around the cover with Wading Plastic No. 2 and thoroughly smear Grease G.S. over all working parts.

TASK 12 — SEALING AIR INLET GRILLE

Materials required :—

Wading Plastic No. 2.
Bostik 89 AA.
Bostik cleaner.

(*a*) Seal all around the air inlet grille with plastic ; this requires GREAT CARE (see Fig. 24). The seam along the front and back and both ends of the grille must be sealed. Also seal the seams where the air inlet stack base is attached to the grille. The base is only tack welded in position and plastic must be used between the welds.

In addition, a seating must be built up of plastic for the fabric which will be placed over the grille during Stage 2 of the sealing, as described below.

Before applying the plastic, paint on a priming coat of Bostik 89 AA, and also paint over the welds securing the air inlet stack base. Allow the Bostik to dry thoroughly before applying the plastic.

(i) First traverse the turret so that the grille is fully exposed, and check that it is securely bolted in place. Clean along the seams with Bostik cleaner.

(ii) Roll plastic out into long thin rolls. Firmly pack the plastic into all the seams (see Fig. 24).

(iii) Build up plastic around the bottom of the air inlet stack base, particularly on the left-hand end (again see Fig. 24).

(iv) Smooth off the edges of the grille attachment lugs with plastic, and also form a seating of plastic in front of the fire extinguisher handles for at least the width of the protection plate at the front of the grille. Also seal with plastic the joints of the stack base to this protection plate.

(*b*) Paint Bostik 89 AA around the bottom edge of the radiator cover plate ; then replace the cover. Bolt it securely in place, and paint Bostik 89 AA round the base of the cover and over the attachment bolts.

Build up a bridge of plastic across to the LEFT HAND corner of the radiator cover, as Fig. 24.

SURFACES MUST BE CLEAN AND DRY

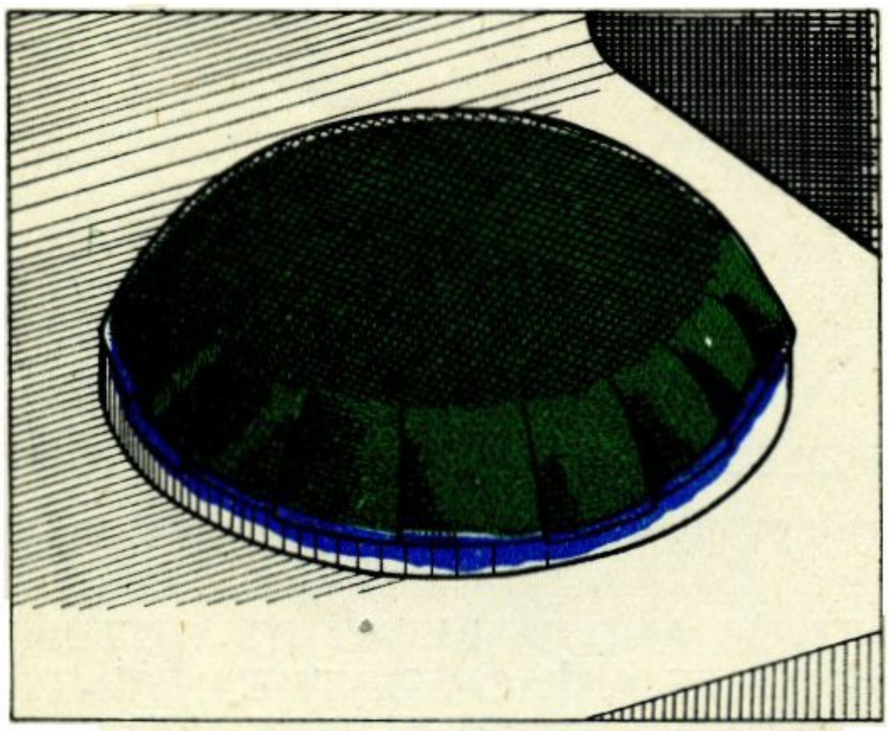


Fig. 25. Fabric on forward hull ventilator.

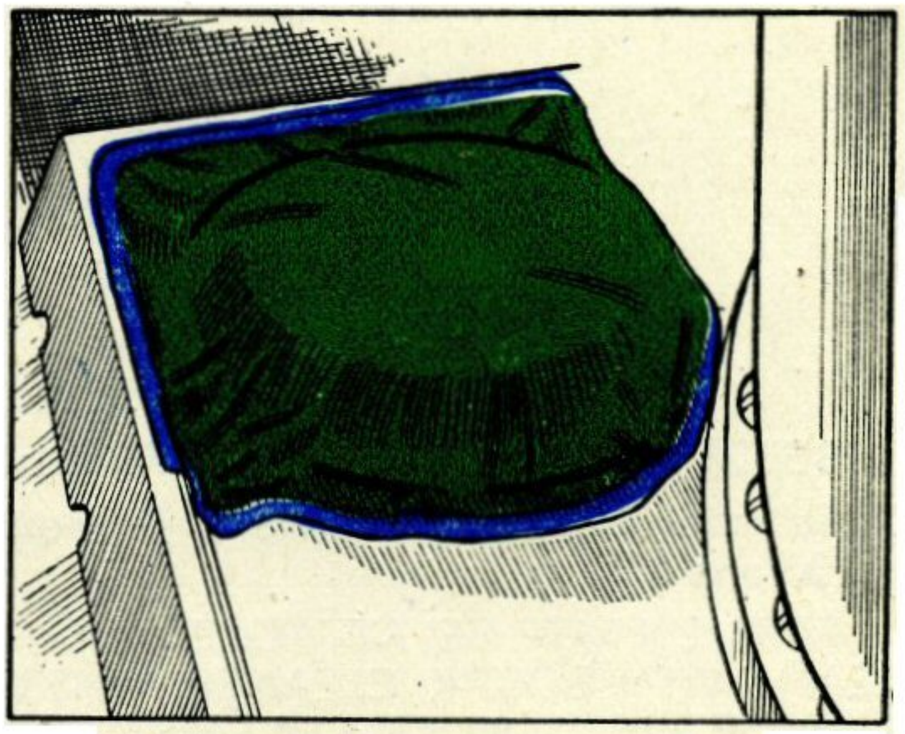


Fig. 26. Fabric on rear hull ventilator.

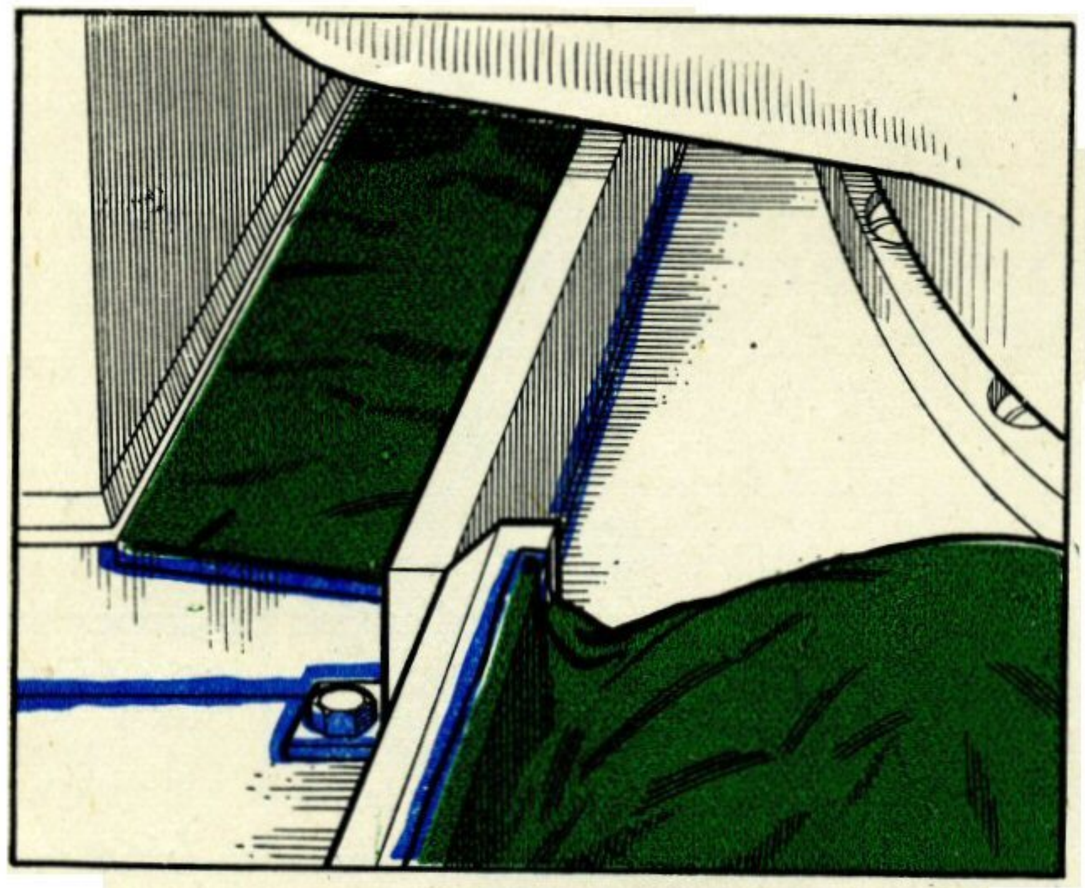


Fig. 27. Fabric on air inlet stack base.

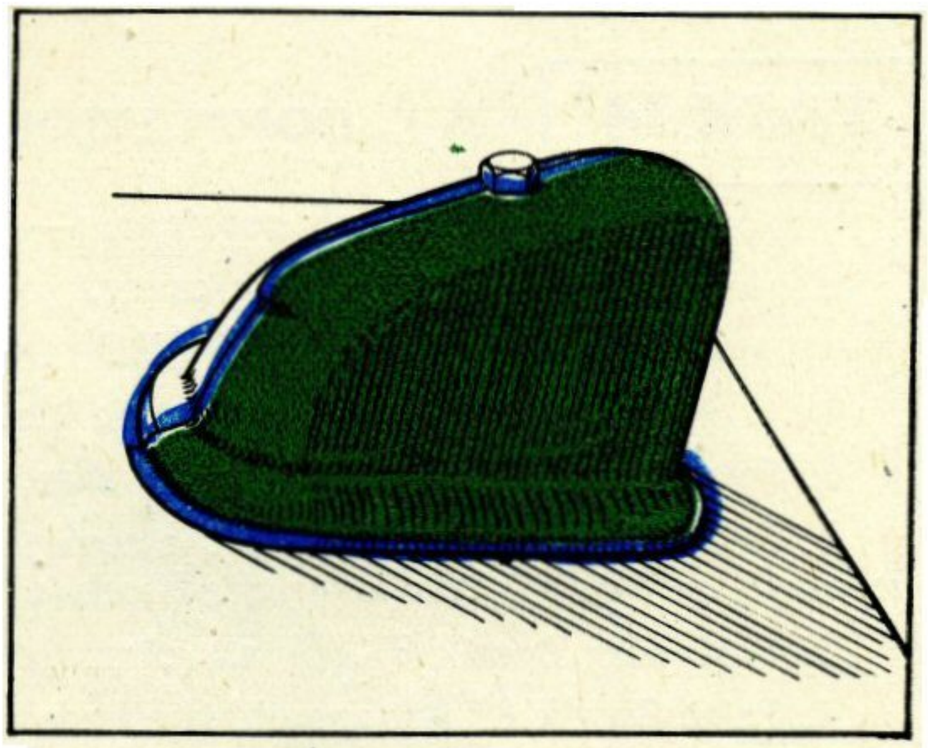


Fig. 28. Fabric over rear sponson ventilator.

Fabric.

Bostik (see Text).

TASK 13 — FITTING FABRIC (except to air inlet grille)

Materials required :—

Fabric covers.
Insulating tape.
Bostik 89 AA.
Bostik cleaner.
Wading Plastic No. 2.

BEFORE FITTING FABRIC ALWAYS INSPECT FOR PIN HOLES BY HOLDING UP TO THE LIGHT.

Selecting the correct fabric cover, according to the markings, fit one to each hull ventilator (see Figs. 25 and 26).

FABRIC MUST BE ATTACHED BY FIRST OFFERING IT UP AND MARKING ITS OUTLINE, CLEAN WITH BOSTIK CLEANER WHERE THE FABRIC IS TO BE ATTACHED, THEN PAINT A BAND OF BOSTIK 89 AA AT LEAST 2" WIDE WITHIN THE OUTLINE OF THE FABRIC, AND ALSO AROUND THE EDGE OF THE FABRIC ON ONE SIDE. WHEN THE BOSTIK 89 AA IS NEARLY DRY, PRESS THE FABRIC NEATLY IN PLACE. ANY BOSTIK 89 AA EXUDING FROM THE EDGE MUST BE SMOOTHED ALONG THE EDGE.

Take up slack in the fabric by making a neat fold at 45 degrees to the edge of the fabric. Make sure that the ends of this fold are sealed.

Fit the fabric over the air inlet stack base as Fig. 27 in the same manner.

Fit fabric covers as above, over each rear sponson ventilator (see Fig. 28).

Fit fabric as described over the co-driver's machine gun as Fig. 30, binding around the muzzle with insulating tape.

NOTE.—First lock the gun in position, if a lock is provided. If a ring of press fastener studs surrounds the gun as Fig. 29 a bridge of plastic must be built up where the fabric crosses the ring.

When Bostik is dry, paint over the edges of fabric covers with Bostik 89 AA.

TASK 14 — COMPLETION OF UPPER HULL SEALING

Materials required :—

Bostik cleaner.
Bostik 89 AA.
Wading Plastic No. 2.

1. Paint Bostik 89 AA over every seam, welded or otherwise, and every bolt head on the upper hull.

2. Paint Bostik 89 AA around the cover plate of the ventilator on the front sloping plate of right hand sponson (see Fig. 31), and over the heads of securing bolts.

3. Seal with Bostik 89 AA all joints of aerial bases and over the attachment bolts.

4. Paint Bostik 89 AA around the base of each rear sponson ventilator, and around each attachment bolt (see Fig. 28).

5. Apply a priming coat of Bostik 89 AA on the outer face of the turret ring guard around any drain holes adjacent to the rear hull ventilator. When the Bostik is dry, plug the holes with plastic.

SURFACES MUST BE CLEAN AND DRY

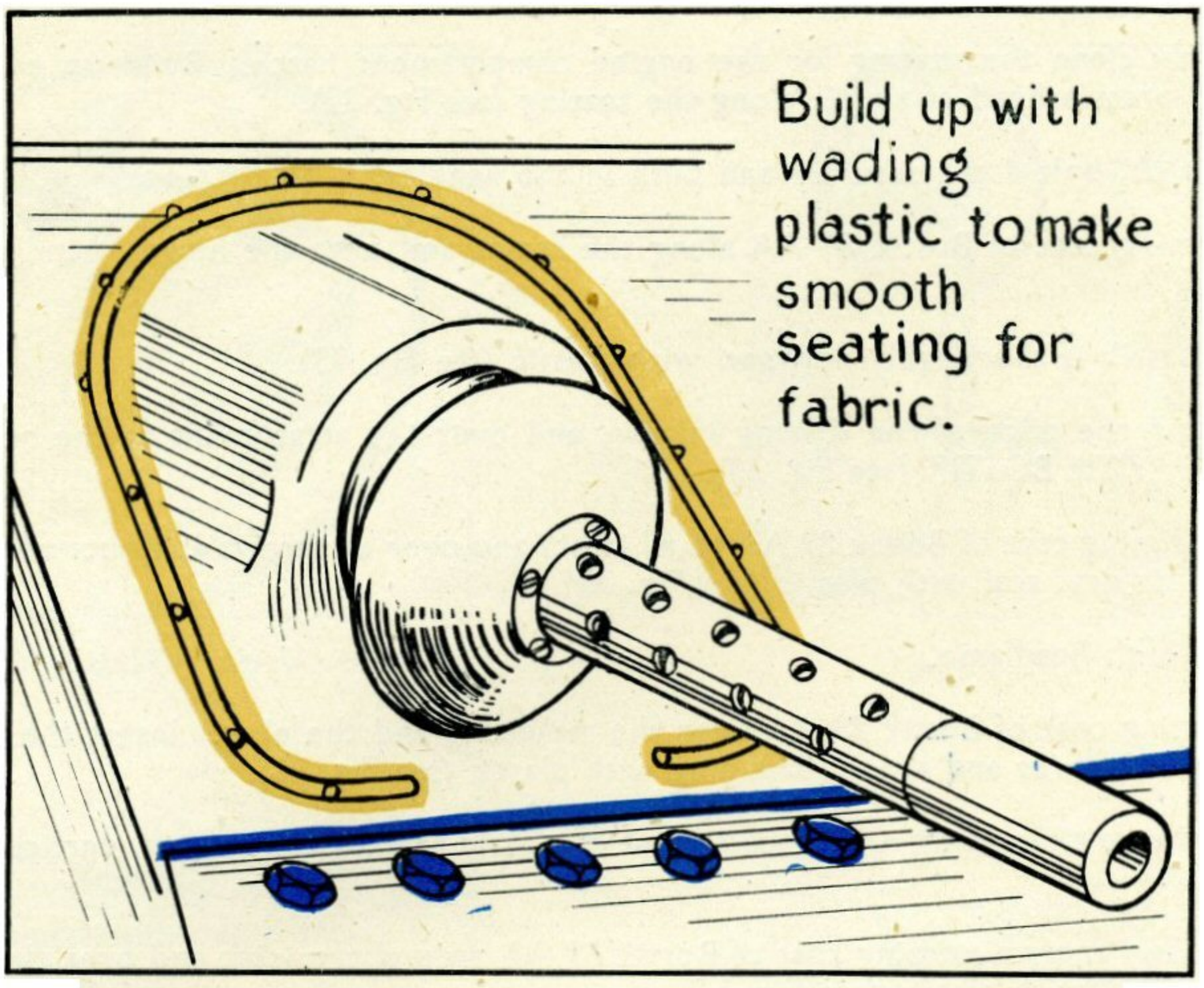


Fig. 29. Co-driver's Machine Gun prepared for fabric.

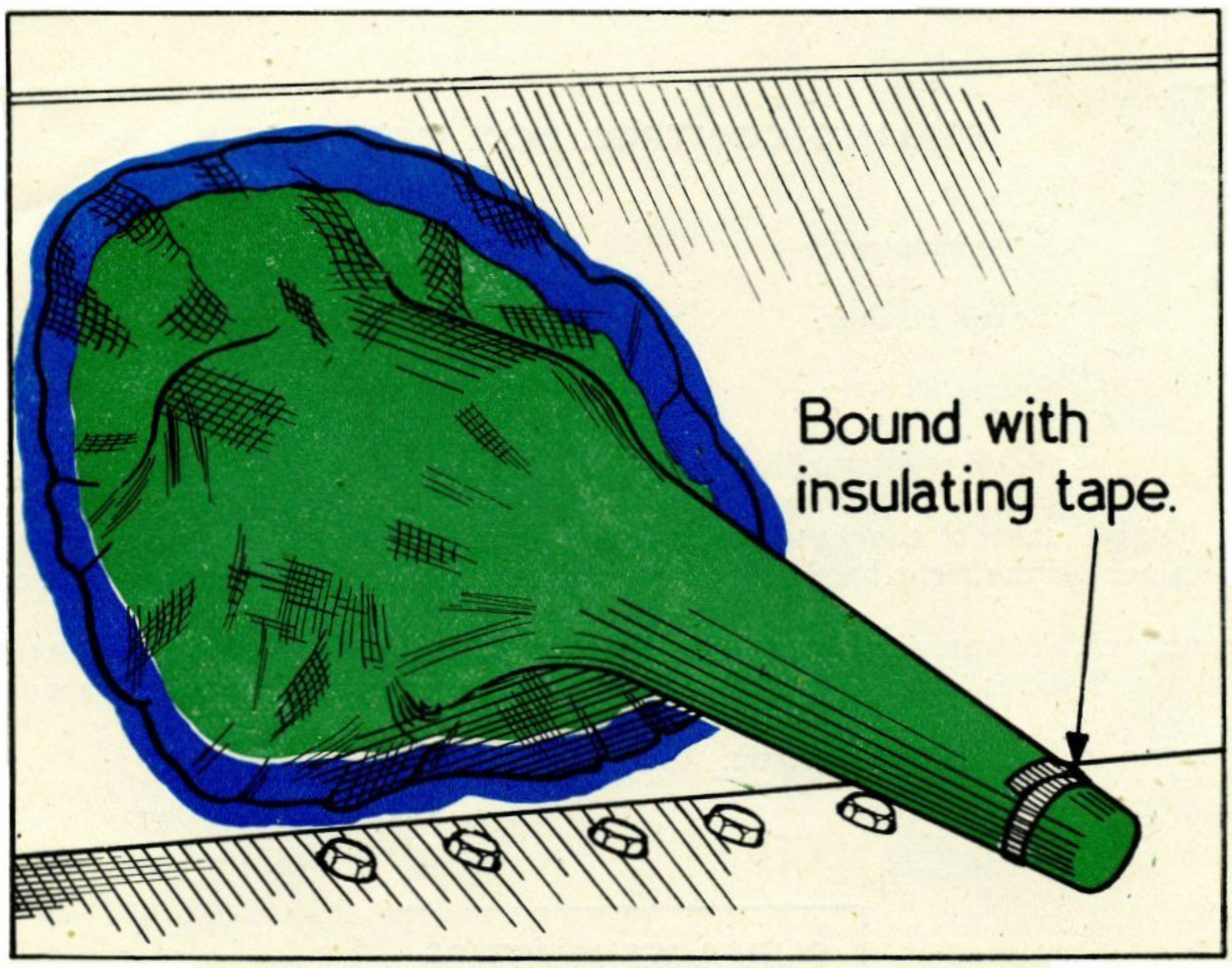


Fig. 30. Fabric over Co-driver's Machine Gun.

Bostik (*see* Text.) Fabric. Wading Plastic No. 2.

6. Thoroughly clean the seating for the engine compartment hatch. Build up each corner with plastic, and then press a bead of plastic along the seating (see Fig. 32).

Close the hatch, bolt down securely and push in the handles.

Apply a priming coat of Bostik 89 AA along the seams and over the hinges, handles and securing bolts.

When the Bostik is thoroughly dry, seal with plastic (see Fig. 33).

7. Seal around the edge of the driving mirror, and over the attachment at the rear with plastic. DO NOT PRIME WITH BOSTIK (see Fig. 34).

8. Apply a priming coat of Bostik 89 AA to all joints and over all screws and nuts on the rear lamps. When the Bostik is dry, seal with plastic (see Fig. 35).

9. Remove each headlamp.

Apply a priming coat of Bostik 89 AA over the mounting and the plug. Insert the plug, and when the Bostik is dry, seal over and around the plug with plastic (see Fig. 36).

10. Open the revolver port and place a bead of plastic around the seating, particularly under the hinge.

Close down and apply a priming coat of Bostik 89 AA around the joint and over the hinge. When the Bostik is dry, seal with plastic (see Fig. 37).

TASK 15 SEALING CONTROL BOX CONTAINER

Materials required :—

Bostik cleaner.

Bostik 89 AA.

Wading Plastic No. 2.

Detach the flexible cord of the hand microphone from the socket on Junction Distribution Box No. 3 in the container on the right hand side of rear plate. Stow the microphone inside the vehicle.

Close the container, and apply a priming coat of Bostik 89 AA along the joints between the container and rear plate, along all seams, around the lid, over the retaining butterfly nut, and around drain holes.

When the Bostik is dry, seal with plastic.

SURFACES MUST BE CLEAN AND DRY

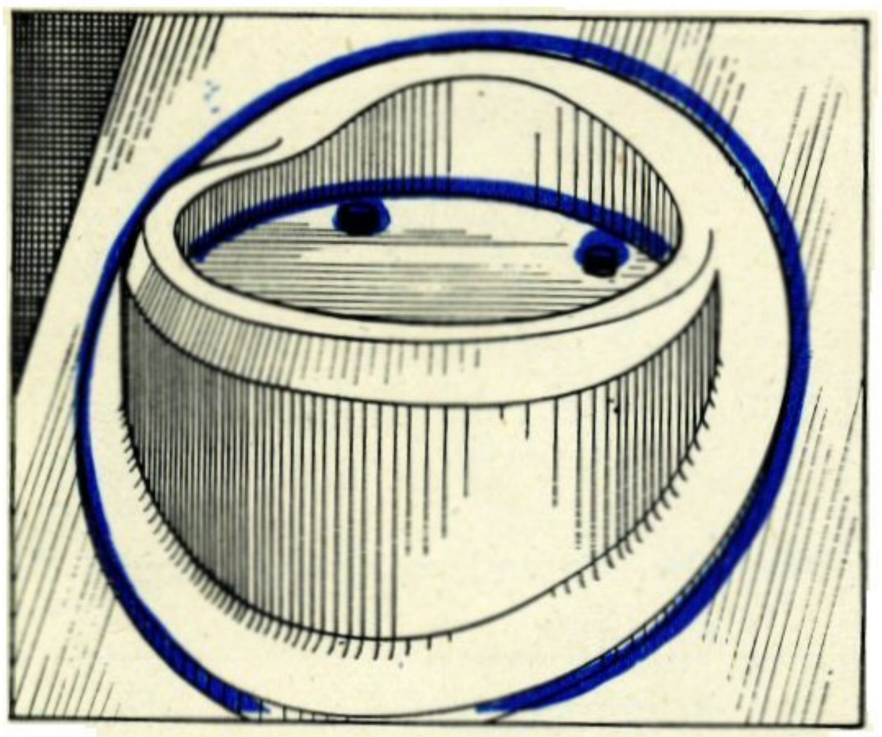


Fig. 31. Ventilator cover plate.

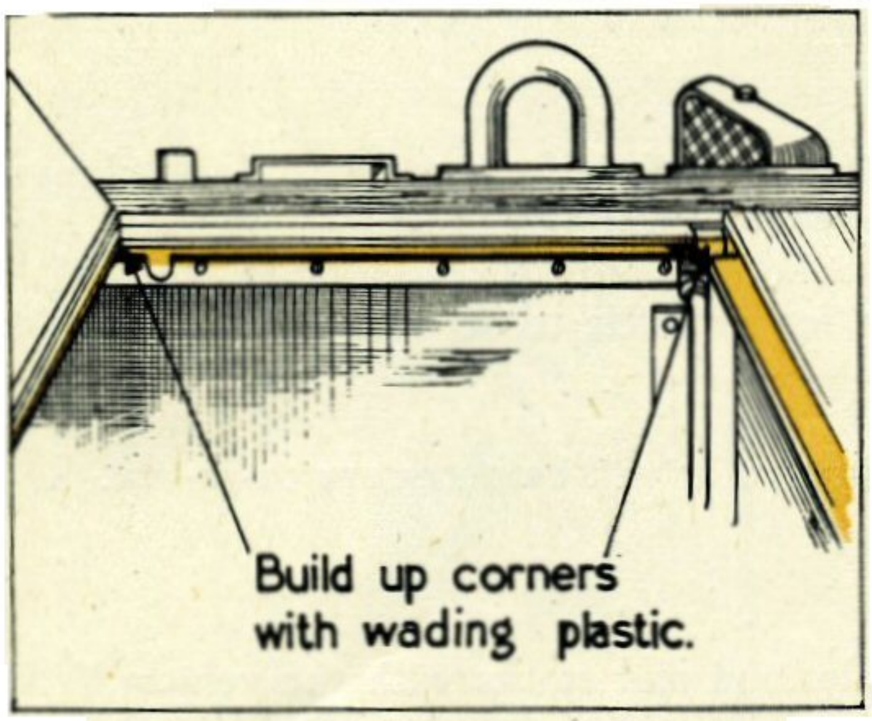


Fig. 32. Engine hatch seating.

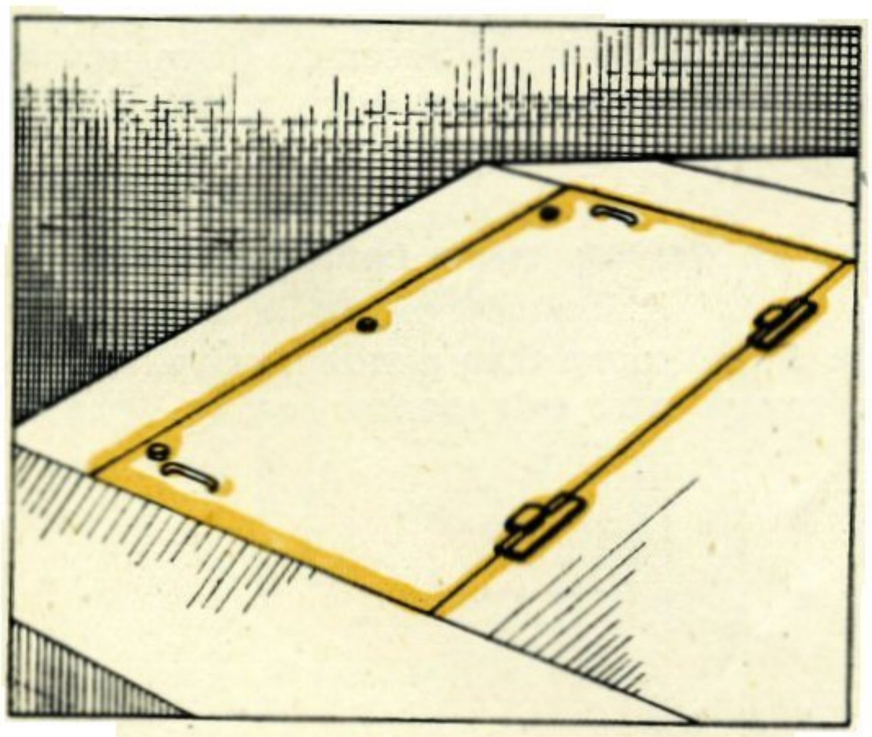


Fig. 33. Engine hatch closed.

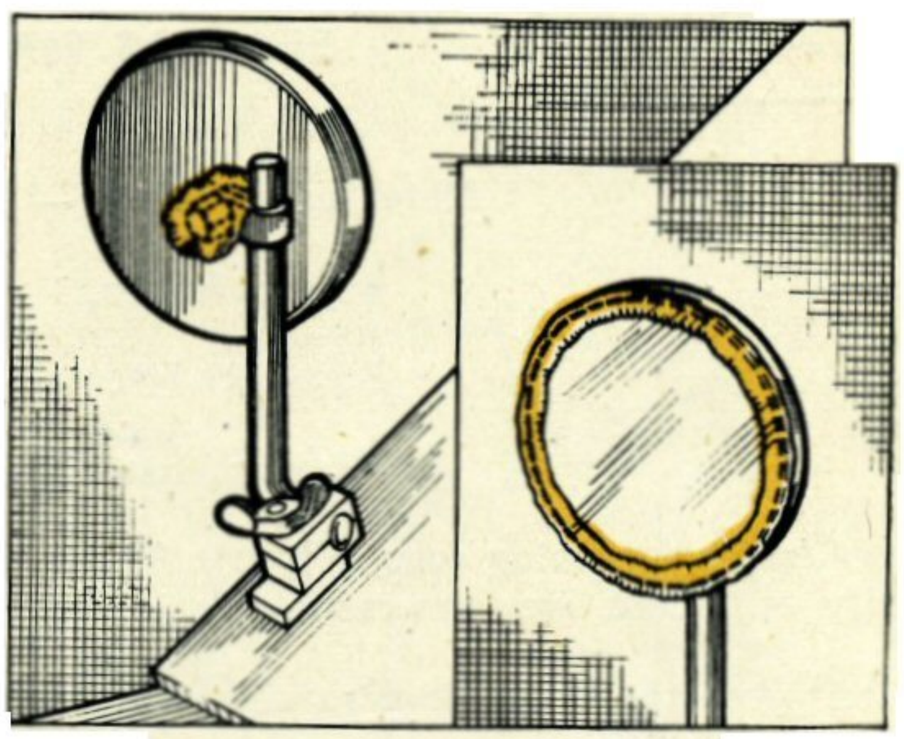
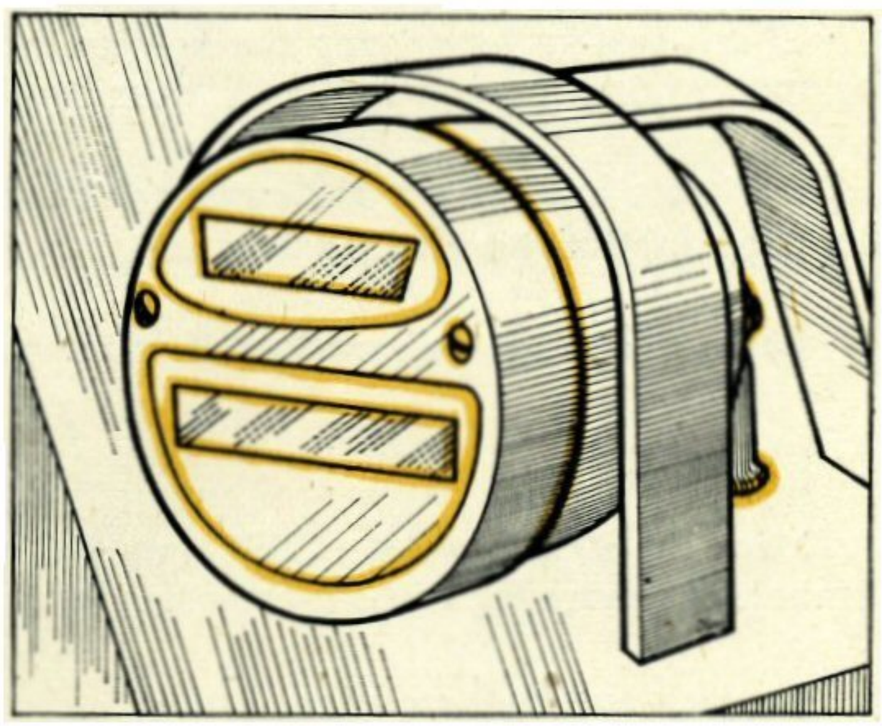


Fig. 34. Driving mirror.



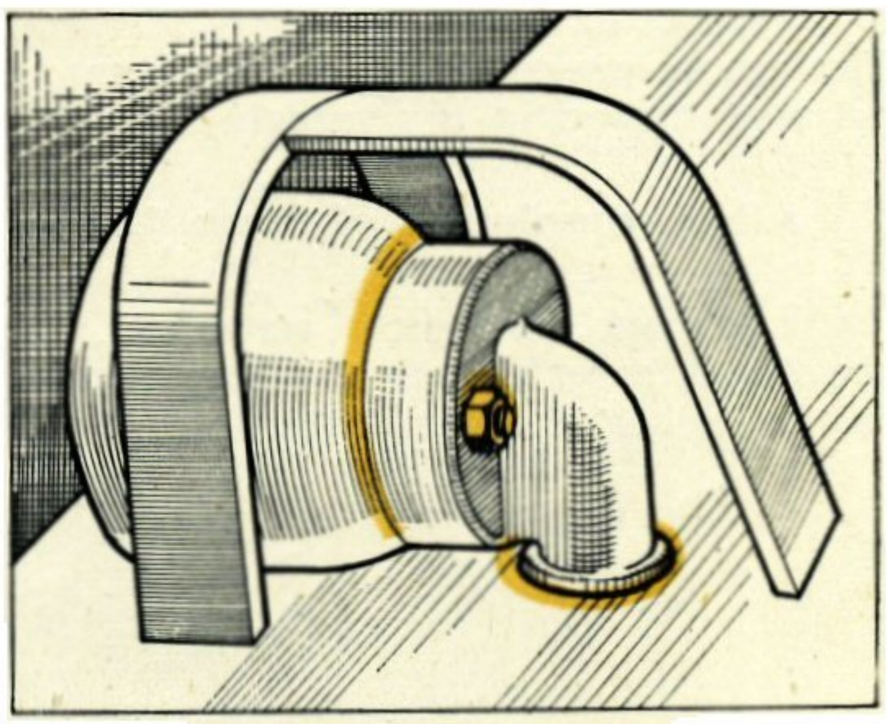


Fig. 35. Rear lamps.

Wading Plastic No. 2.

Bostik (see Text).

TASK 16

SEALING FIRST AID BOX CONTAINER

Materials required :—

B ostik cleaner.

B ostik 89 AA.

Wading Plastic No. 2.

Apply a priming coat of B ostik 89 AA along the joint between the box and rear plate, around the edge of lid and over the catch.

When the Bostik is dry, seal with plastic.

TEST SEALING

Check sealing by driving the vehicle into 4′ of water. Watch carefully for any sign of leaks ; mark any spot where these occur, and, after leaving the water, re-seal as necessary.

A 4′ test has been found sufficient check on sealing even for a vehicle to be waded to 6′, provided the crew have done their job.

Remove the air exit stacks. If water has entered the adaptors, it will be necessary to re-seal.

Mark the air exit stacks LEFT and RIGHT, and the air inlet and exit stacks with the vehicle W.D. number. Prepare for transit, together with the greatcoat bin and Hollebone drawbar, lashed on the hull.

Replace external stowage.

Vehicles have been immobilised through their tracks rusting up during a protracted sea voyage. This can be prevented by oiling the tracks. **A used petrol tin must be filled with waste engine oil and stowed in the vehicle for this purpose.**

After completion of Stage I, the vehicle must not be driven more than 100 miles.

If to reach the point of embarkation the vehicle has to be driven more than a mile or two, remove the air exit cover plate to assist engine cooling and to prevent damage to air exit adaptor sealing. Replace this cover before embarking.

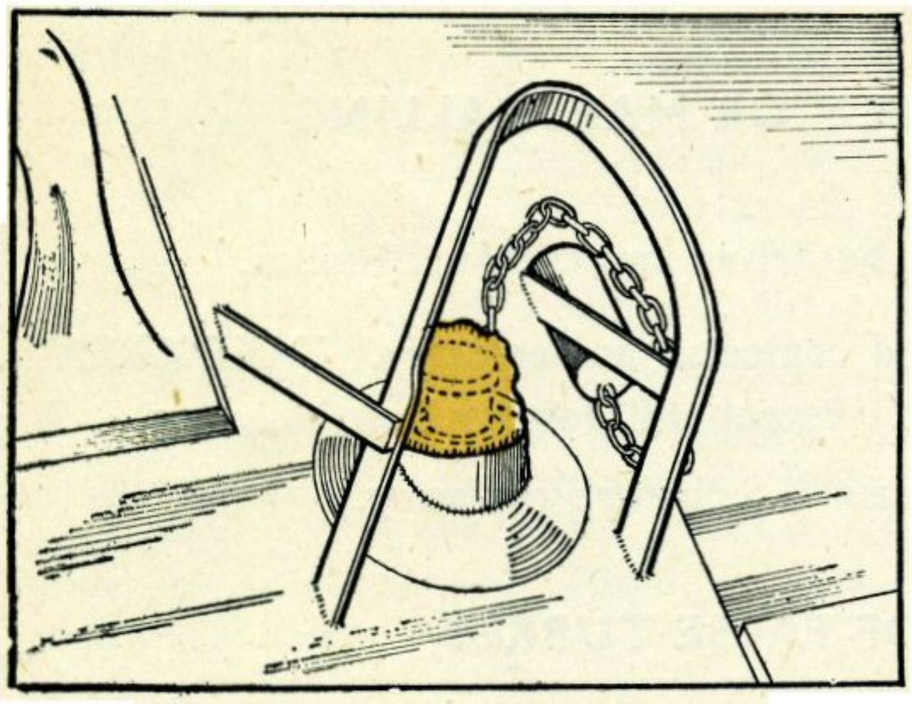
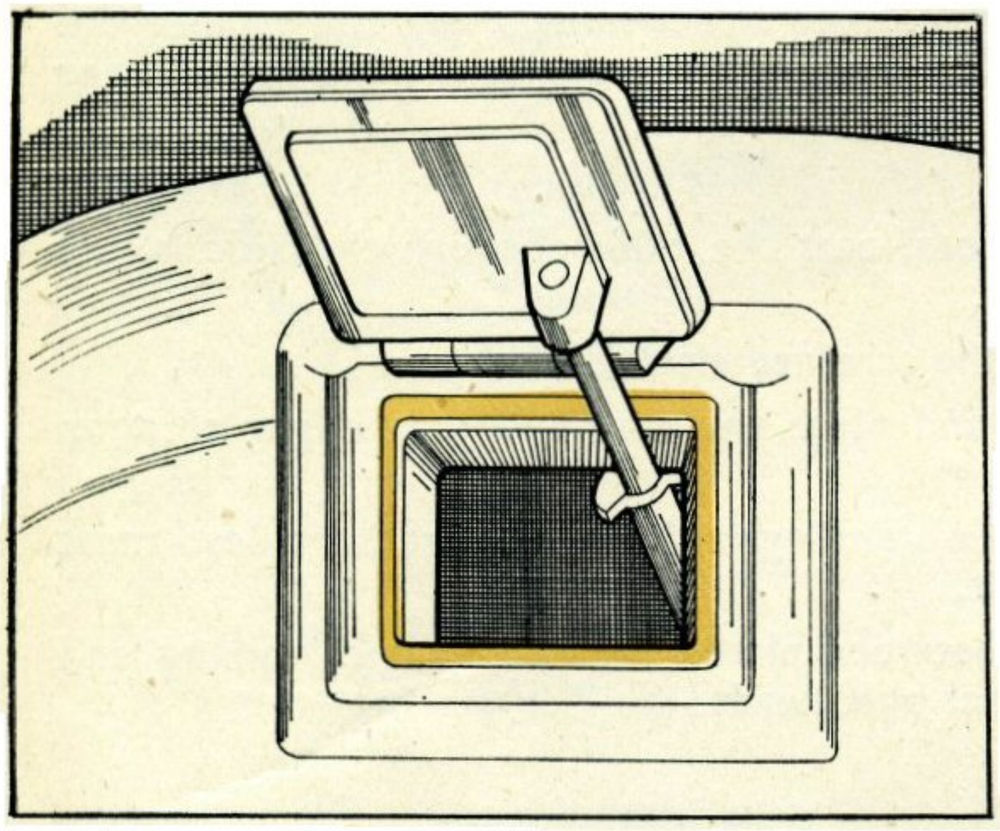


Fig. 36. Sealing headlamp mounting.



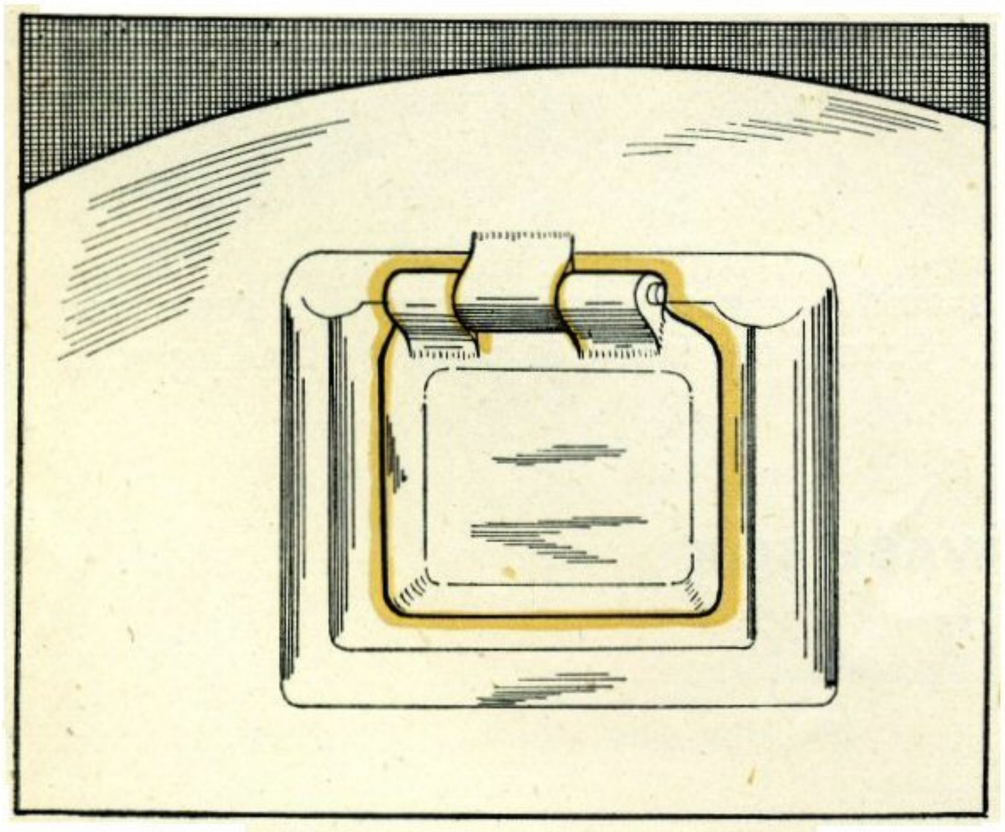


Fig. 37. Revolver port.

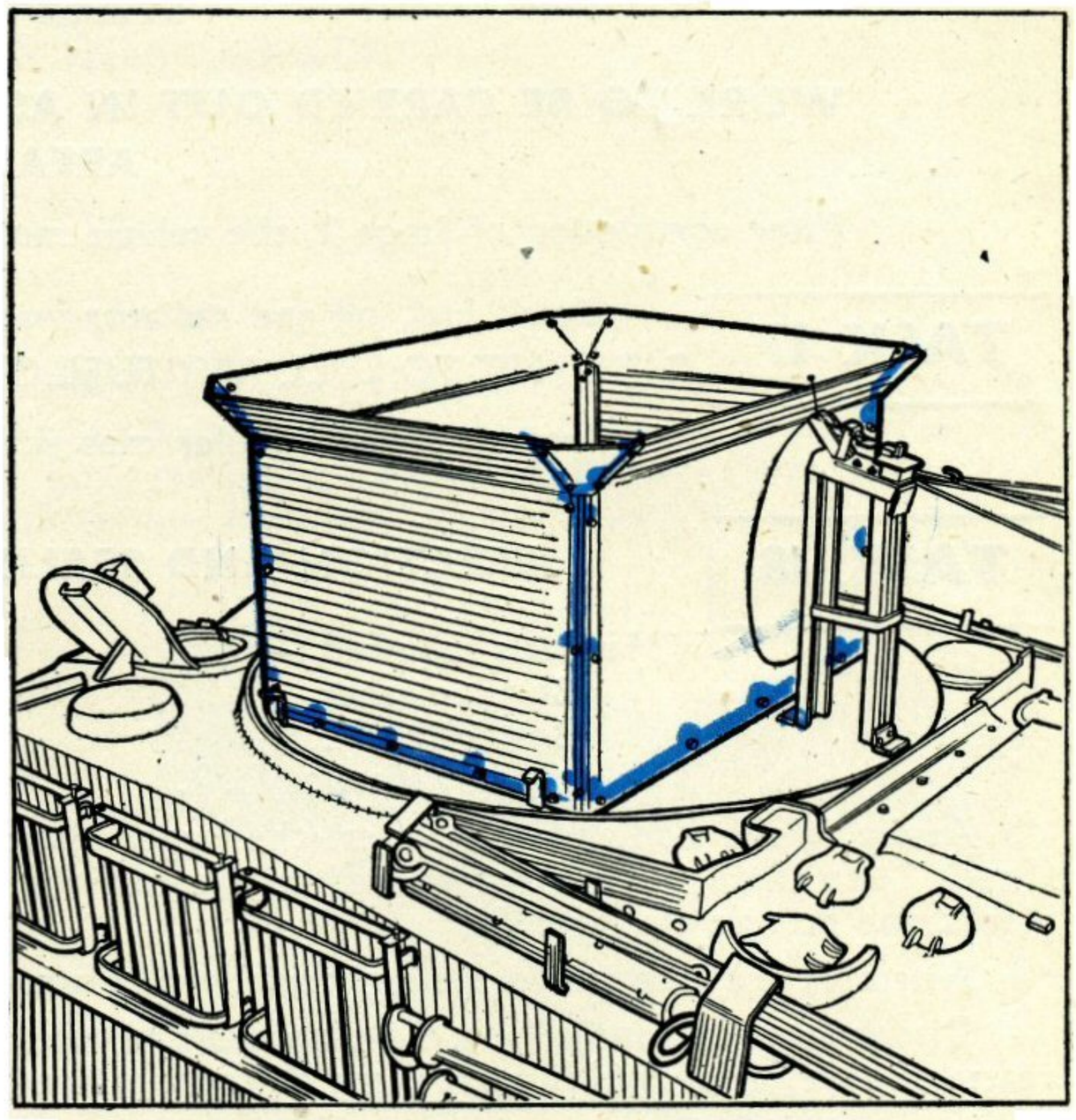


Fig. 38. False turret and release gear stand.

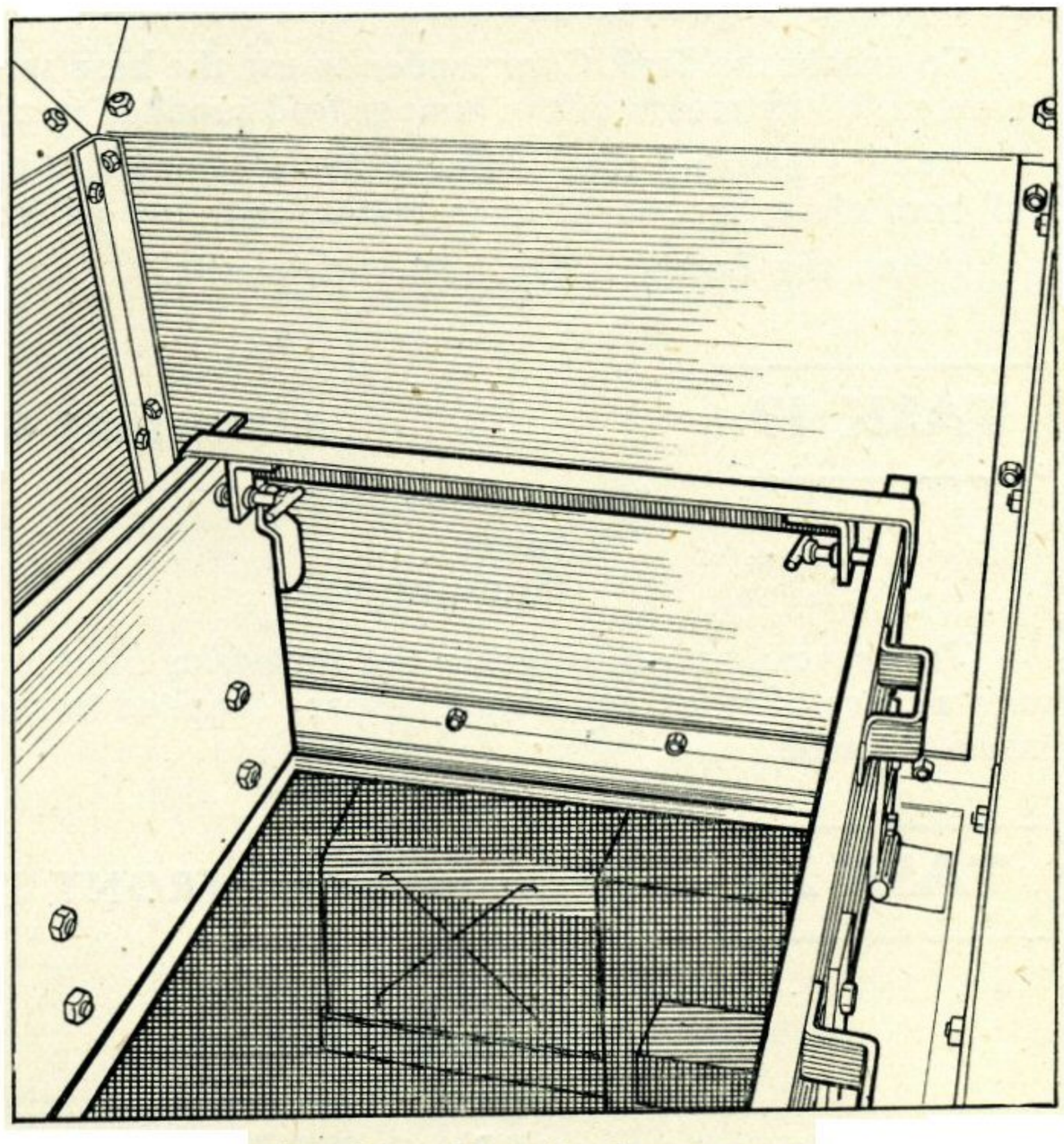


Fig. 39. Hatch door stay.

Wading Plastic No. 2.

Bostik (see Text).

STAGE 2

WORK TO BE CARRIED OUT IN ASSEMBLY OR MARSHALLING AREA

After completion of Stage 2, the vehicle must not be driven more than 20 miles.

TASK 17

Check fuel, oil and radiator water, and replenish as necessary. TAKE GREAT CARE NOT TO SPILL ANY FUEL OR OIL. Petrol will destroy Bostik sealing.

Grease threads of filler caps with Grease G.S. before replacing.

TASK 18

ERECTION AND SEALING OF FALSE TURRET

Materials required :—
Bostik cleaner.
Bostik 89 AA.
Wading Plastic No. 2.

Assemble the side and end plates (the larger plates are termed the " sides " and the smaller the " ends ") to the angle framing welded to the roof plate. Erect the corner angles, fit the four corner pieces, and bolt up (see Fig. 38).

Assemble the step inside the right hand end plate.

Disconnect the handle from Bowden cable of release gear, pass the cable through the hole in the rearmost side plate of false turret, and re-connect handle.

Hook the handle where convenient, but *not to any of the screened electric cables.*

Open roof plate hatch doors to the vertical position and place the stay over top edges of door (see Fig. 39). Tighten clamp nuts.

To enable the Tank Commander to use the head set while standing in the false turret, the lead must be extended by means of the jumper lead supplied in the kit.

Apply a priming coat of Bostik 89 AA along all joints between plates, between angle framing and hull roof plate, around holes in plates, and over all external bolt heads.

When the Bostik is dry, seal with plastic.

TASK 19

AUXILIARY GENERATOR

Materials required :—
Fabric.
Insulating tape.

To prevent splash entering the air intake filter on the auxiliary generator, cover the generator with a piece of fabric cut from the spare supplied in the kit. Secure the fabric in place by binding with insulating tape.

TASK 20

SEALING FRONT STOWAGE BOX

Materials required :—
Bostik cleaner.
Bostik 89 AA.
Wading Plastic No. 2.

Apply a priming coat of Bostik 89 AA around the drain holes in the bottom of the box, along all seams, around the lid and over hinges.

When the Bostik is dry, seal with plastic.

TASK 21

FABRIC ON AIR INLET GRILLE

Materials required :—
Bostik cleaner.
Bostik 89 AA.
Fabric cover.

Seal air inlet grille by fabric cover as Fig. 40.

To attach fabric, paint a 2″ band of Bostik 89 AA around the grille and over the corner of radiator cover where built up with plastic. Paint a 2″ band of Bostik 89 AA around the edge of fabric, on the rough side. When the Bostik 89 AA is nearly dry, press the fabric in place, making sure that it is attached effectively at all corners. The inner edge of the fabric must be turned up to fit along the edge of the air inlet stack base.

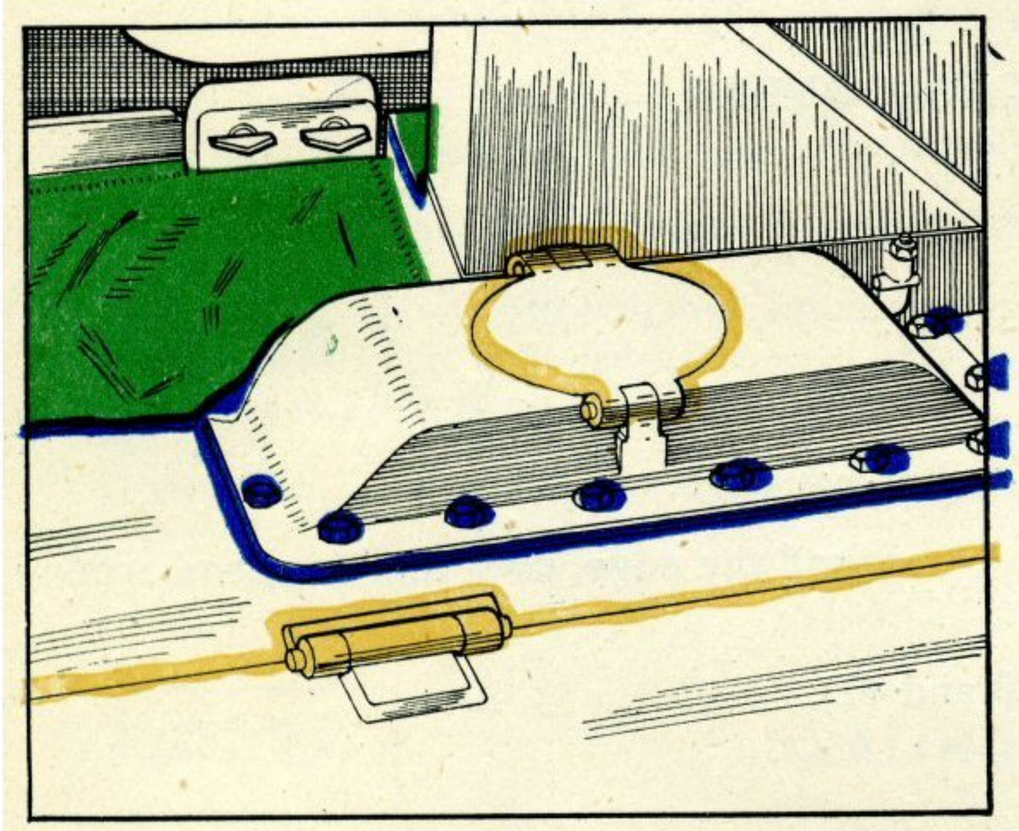


Fig. 40. Fabric over air inlet grille.

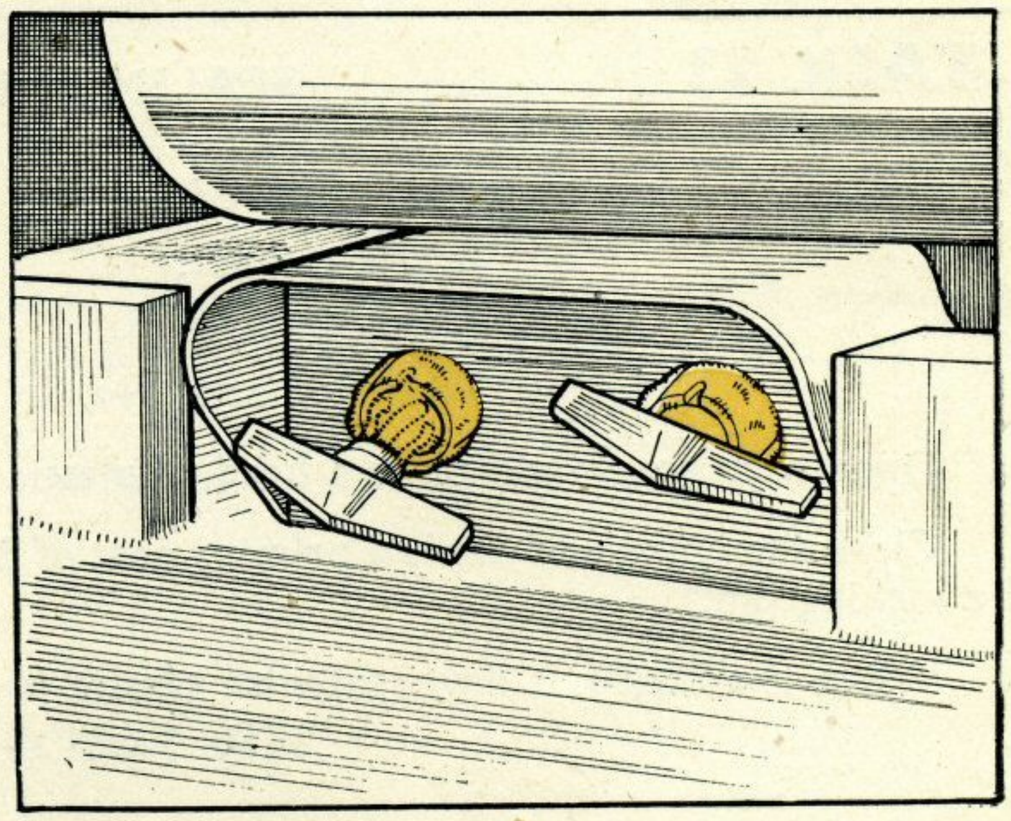


Fig. 41. Sealing fire extinguisher handles.

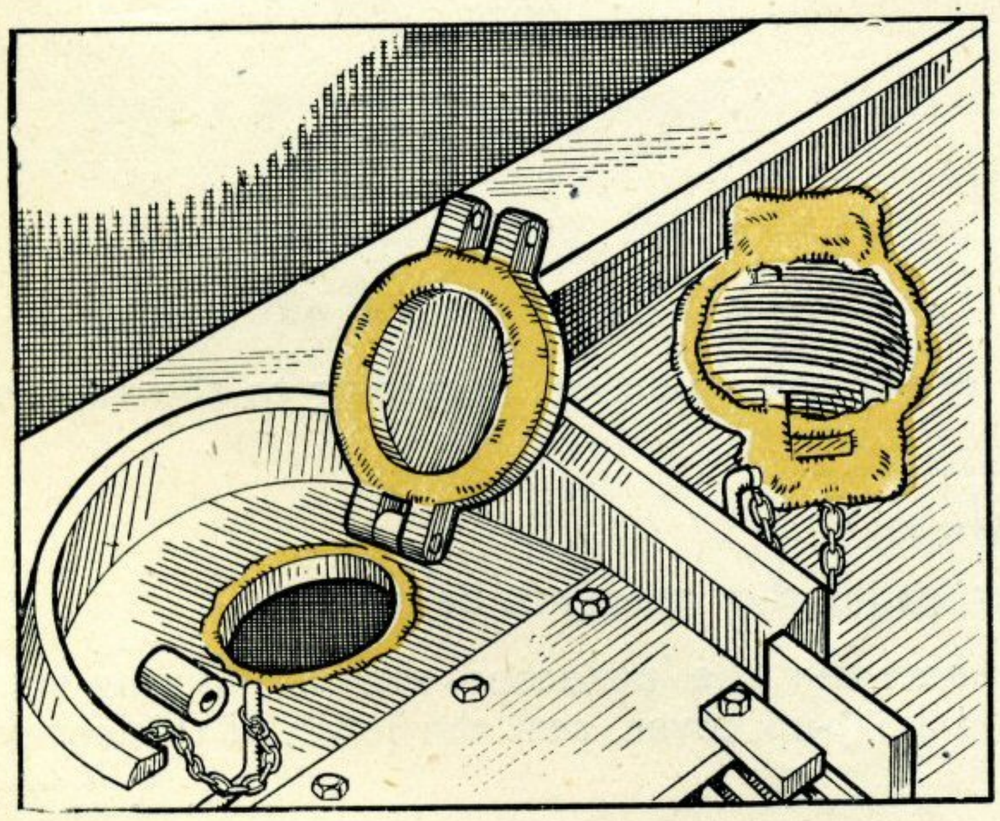


Fig. 42. Filled cap covers.

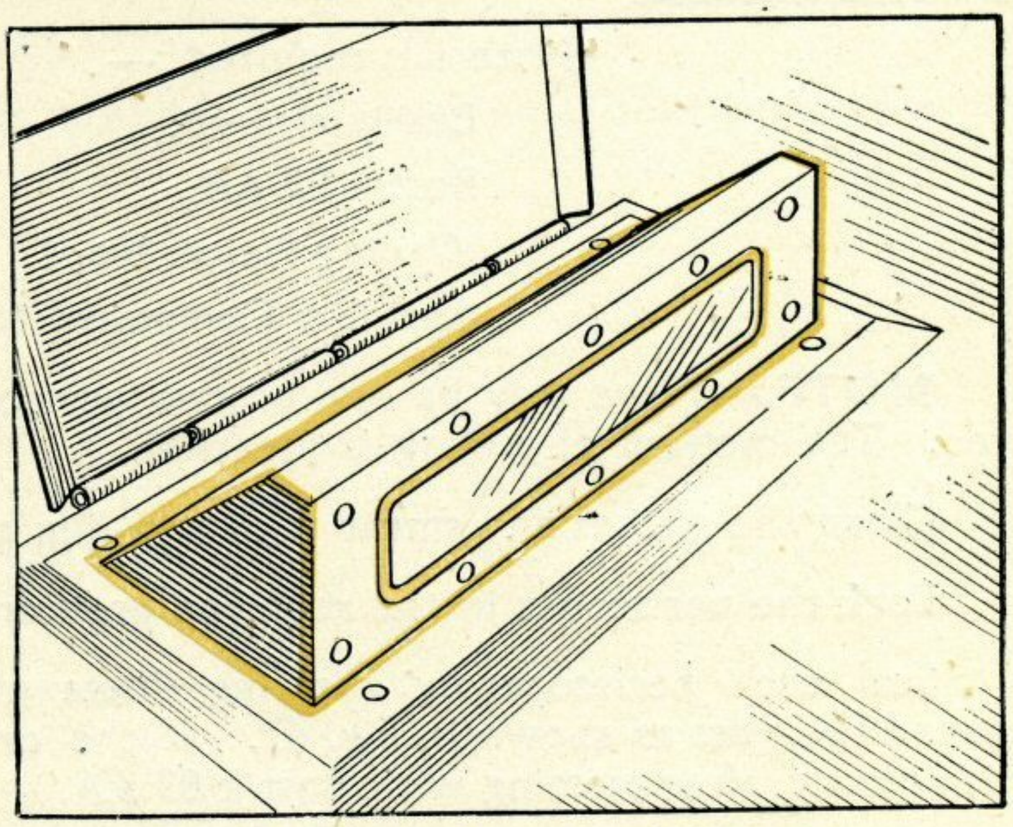


Fig. 43. Sealing periscopes.

SURFACES MUST BE CLEAN AND DRY

Bostik (see text). Fabric. Wading Plastic No. 2.

TASK 22 SEALING FIRE EXTINGUISHER HANDLES

Materials required :—

Bostik cleaner.

Wading Plastic No. 2.

Using Wading Plastic No. 2, seal the fire extinguisher handles (see Fig. 41).

Carefully pull out each handle $\frac{1}{2}$" or so, and pack plastic into the handle tube. Replace each handle and spread plastic around the outside. DO NOT PRIME WITH BOSTIK.

TASK 23 SEALING FILLER CAP COVERS

Materials required :—

Bostik cleaner.

Bostik 89 AA.

Wading Plastic No. 2.

Open each cover and place a bead of plastic around its bottom edge.

Close the cover and apply a priming coat of Bostik 89 AA around the edge, over the hinge and around the locking pin.

When the Bostik is dry, seal with plastic (see Figs. 40 and 42).

TASK 24 SEALING DRIVER'S AND CO-DRIVER'S PERISCOPES

Materials required :—

Bostik cleaner.

Bostik 89 AA.

Wading Plastic No. 2.

Anti-dim Compound No. 2.

NOTE.—There may be one or two periscopes for driver and co-driver, according to the vehicle type. The method of sealing is identical.

Clean the glasses and smear with anti-dim compound.

Lock the periscopes in the required position, as after sealing they must not be moved.

Seal each periscope by applying fillets of plastic between the periscope and its housing and around the glass as shown in Fig. 43. If the prism has a built-up cover, seal the joints of this cover with plastic, after priming with Bostik 89 AA.

With the movable type periscope on the hatch, seal the barrel mounting with plastic. Also seal the turntable by laying plastic along the seams and over the bolts, after priming with Bostik 89 AA.

Do not use more plastic on vision devices than is necessary for a proper seal, as it may smear and obscure vision.

TASK 25

RE-ERECTION AND SEALING OF AIR INLET AND EXIT STACKS

Materials required :—

Bostik cleaner.
Bostik 89 AA.
Wading Plastic No. 2.
Grease G.S.

Erect the air inlet and exit stacks as previously described. Attach and carefully adjust the T bolts and straining rods as already described. When satisfied that the stacks are correctly seated, proceed to seal as follows :—

(*a*) *Air inlet stack.* Seal the joint between the stacks and its base, and over the T bolts with a thin coating of Grease G.S. Ensure that the coating is continuous and well smoothed off.

(*b*) *Air exit stacks.* Apply a priming coat of Bostik 89 AA around the joint between stack and adaptor. When the Bostik is dry, seal along the joint and over the T bolts with plastic.

Coat the release gear liberally with Grease G.S.

TASK 26

Thoroughly lubricate all suspension, transmission and bogie wheels according to the requirements of the Lubrication Chart in the Crew Maintenance Insert in A.B. 413.

Coat with Grease G.S. all exposed working parts and items of stowage likely to be affected by corrosion.

TASK 27

SEALING GREATCOAT BIN

Materials required :—

Bostik cleaner.
Bostik 89 AA.
Wading Plastic No. 2.

Apply a priming coat of Bostik 89 AA over all seams, around to lid, over hinges, and around drain holes.

When the Bostik is dry, seal with plastic.

Re-stow the bin on the top of hull.

SURFACES MUST BE CLEAN AND DRY

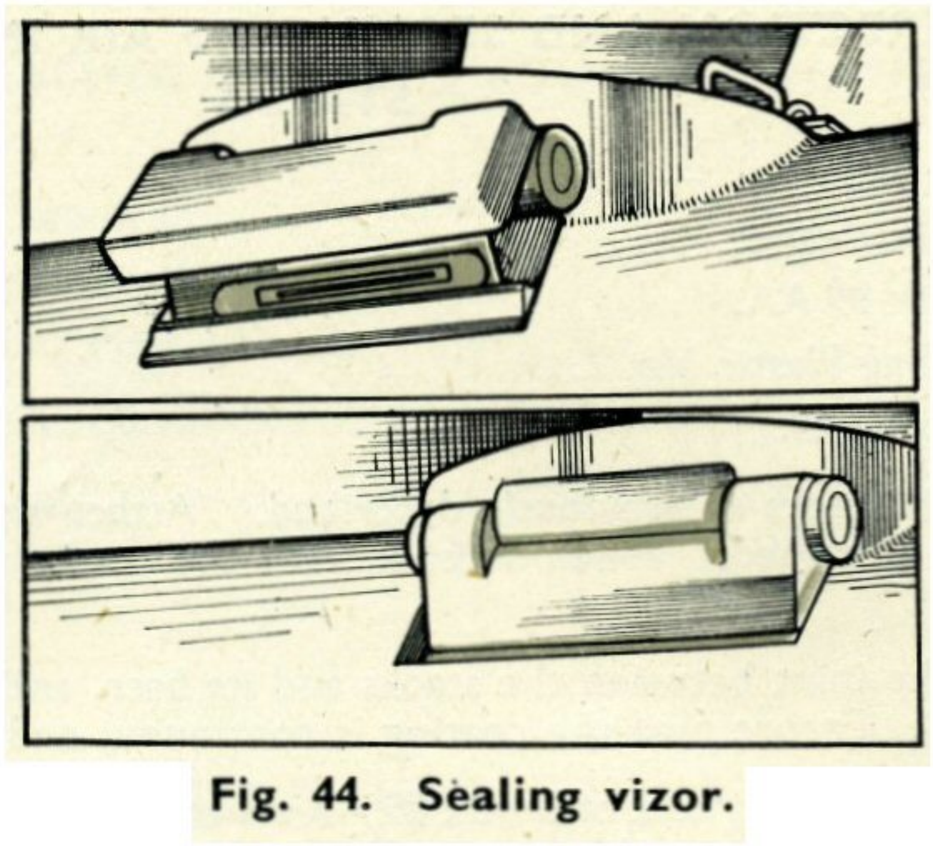


Fig. 44. Sealing vizor.

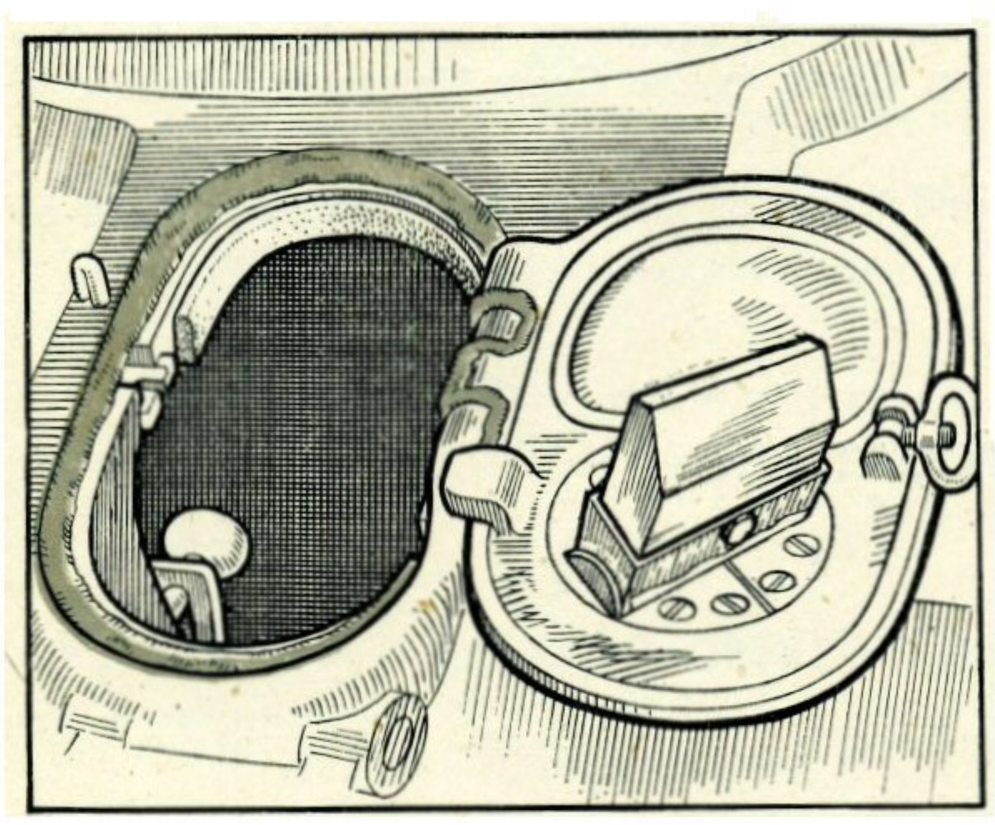


Fig. 45. Hatch sealing (open).

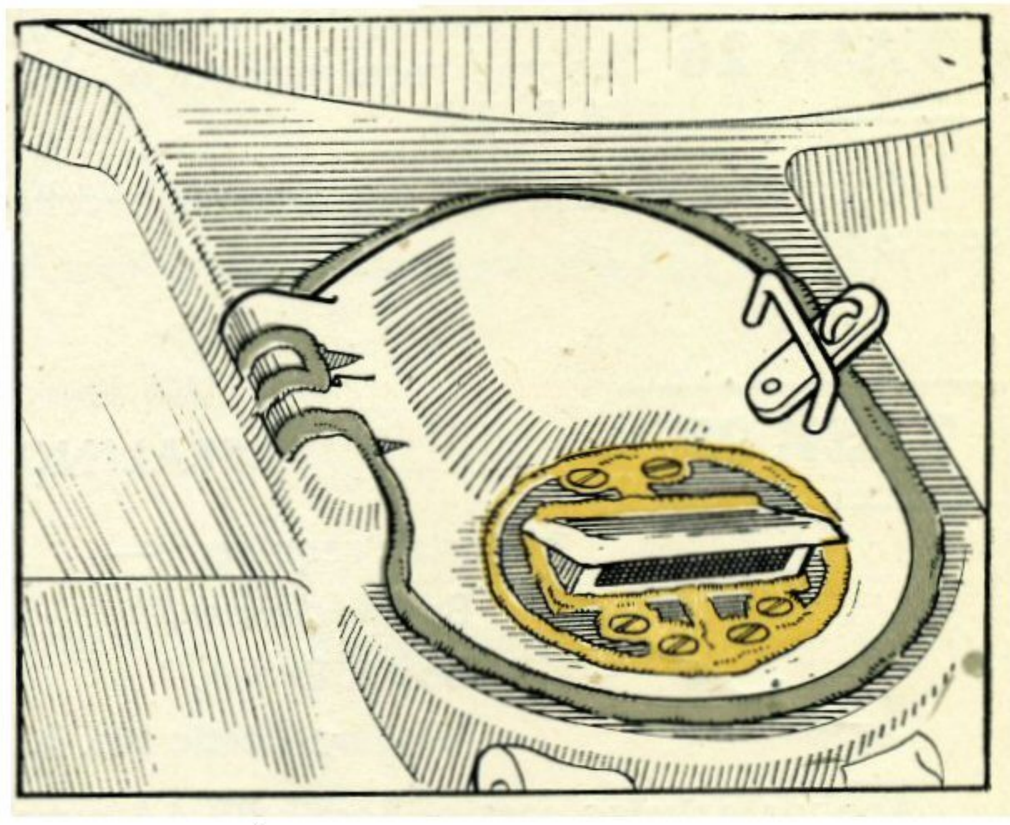


Fig. 46. Hatch sealing (closed).

STAGE 3

PREPARATION AFTER EMBARKATION

TASK 28 SEALING DRIVER'S AND CO-DRIVER'S VIZORS

Materials required :—

Bostik cleaner.

Asbestos compound.

Using asbestos compound, seal the driver's and co-driver's vizors, if fitted. Open each vizor and lay a bead of compound around vision slit (see Fig. 44). Be careful not to obscure the slit. Close vizor and seal around the outside of the vizor cover and over the hinge with compound.

Asbestos compound. Wading Plastic No. 2.

TASK 29 Check over all sealing, particularly the sealing with asbestos compound and Grease G.S. Examine for cracks in surface of compound and smooth over where necessary to rectify.

TASK 30 Grease the clutch by applying the grease gun to the two greasers in the fighting compartment.

TASK 31 Sheet the vehicle over, if possible, during transit, to minimise damage from corrosion caused by spray or salt water. Smear tracks with waste oil daily.

TASK 32 Warm the engine.

TASK 33 **SEALING DRIVER'S AND CO-DRIVER'S HATCHES**

Materials required :—

Bostik cleaner.

Asbestos compound.

Each hatch can be sealed from within the vehicle, it need not be closed until the vehicle is ready to leave the craft. Lay a thick bead of asbestos compound along the seating for each hatch, as Fig. 45, particularly beneath the hinge. Then close and lock each hatch. There should be enough compound to exude round the hatches (see Fig. 46), and if convenient this compound may be smoothed down by some person outside the vehicle.

AFTER HATCH SEALING IS COMPLETE, UNLOCK EACH HATCH AND TIE BACK THE CATCH SO THAT IT CANNOT RE-ENGAGE ACCIDENTALLY.

TASK 34 Prepare machine gun for action.

NOTE.—This should be done at the last practicable moment.

Extract the pull-through, by pulling smartly from the breech of gun.

Dry clean the chamber, using a chamber stick.

SEE THAT THE TOWING ROPE IS SHACKLED UP TO THE FRONT EYE AND THE ROPE CARRIED OVER THE HULL, WITH THE FREE END WITHIN REACH OF THE CREW COMMANDER.

Leave craft carefully, to avoid excessive bow wave when entering the water. But keep the engine revs. up, and keep going at all costs, so as not to obstruct following vehicles.

The driver must beware of a tendency to skid on the ramp. To avoid this, approach the point of balance slowly and square on. Once over the point of balance, DO NOT ATTEMPT TO BRAKE OR STEER.

NOTES

STAGE 4

ACTION TO BE TAKEN IMMEDIATELY ON LANDING

As soon as the tank commander is certain not more than 3′ of water will be encountered again, **operate air inlet stack release gear,** to jettison stack.

If any water is in the vehicle, open a dump valve to allow it to drain out.

STAGE 5

MAINTENANCE TO BE CARRIED OUT AT THE FIRST OPPORTUNITY AFTER LANDING

Remove air exit stacks and adaptors.

Remove false turret and release gear stand.

Check that all water has drained from the hull.

Remove plastic from the ends of the transverse channels, marked "B" in Fig. 10.

Remove plastic from engine sealing.

Remove all sealing from sponson drain holes "A" in Fig. 13.

Carry out weapon maintenance and full lubrication of vehicle to Crew Maintenance Insert to A.B. 413.

The oil level should be checked to see whether water has entered in any quantity.

Remove the sealing from escape hatch.

Remove the fabric sealing from the vehicle.

Replace dust deflector, if one was fitted to the vehicle.

Replace rear stowage bin.

Re-stow the Hollebone drawbar.

NOTES

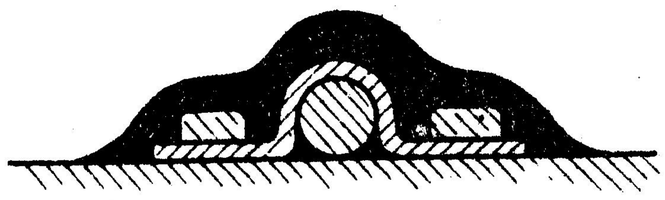
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TASK CARD

SHERMAN V A.R.V.I. **Vehicle W.D. No.....**

Task No.	*Item*	*Initial completed*
	STAGE 1	
1	Initial preparation	.....
2	Engine protection	.....
3	Sealing lower hull	.....
4	Fitting air exit adaptors and cover plate ...	.....
5	Sealing rear engine doors	.....
6	Re-fitting air exit adaptors and cover plate	.....
7	Fitting jointing strips	.....
8	Erection of air inlet stack (Rehearsal) ...	.....
9	Erection and sealing of air exit stacks ...	.....
10	Completion of lower hull sealing	.....
11	Armament maintenance	.....
12	Sealing air inlet grille	.....
13	Fitting fabric (except to air inlet grille) ...	.....
14	Completion of upper hull sealing	.....
15	Sealing control box container	.....
16	Sealing first aid box container	.....
	STAGE 2	
17	Check fuel, oil and water	.....
18	Erection and sealing of false turret	.....
19	Auxiliary generator	.....
20	Sealing front stowage box	.....
21	Fabric on air inlet grille	.....

FIG. III



Section at 'A' shewing A.C. feathered off at edges.

A.C.

A

A

A.C.

A.C.